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SYDENHAM ON "A DYSENTRY"

KENNETH DEWHURST

Thomas Sydenham was practising in Pall Mall in 1667 when John Locke arrived in the metropolis as physician to Lord Ashley. During the previous year the appearance of Sydenham's *Methodus curandi febres* had led to much controversy at a time when physicians valued subtle speculations more highly than careful observations based on honest practice. This modest little book, wherein the author treats of epidemic diseases which he himself had observed between the years 1661-1664, was the first of several volumes which later brought about a complete reformation in clinical medicine. John Locke, then a practising physician but later destined to achieve more enduring fame as a philosopher, was quick to realize the merit of Sydenham's work. He lost no time in forming (or strengthening) an acquaintance with its author. A second edition soon appeared which was prefaced with a long poem in Latin by Locke, of which a few lines are sufficient to show his admiration for Sydenham's methods.

> Still Fever burns and all her skill defies,
> Till Sydenham's wisdom plays a double part,
> Quells the disease, and helps the failing Art.[1]

Soon afterwards the friendship between these two great men blossomed

[1] Payne, J. F. *Thomas Sydenham* (1900), p. 129.

into active collaboration; for in 1668 Sydenham wrote to their common friend, Robert Boyle:

> I perceive my friend Mr. Locke hath troubled you with an account of my practice as he hath done himself in visiting with me very many of my variolous patients especially.[2]

At this time the two physicians were paying particular attention to the study of smallpox epidemics as Sydenham contemplated writing a separate treatise on this disease for which Locke prepared a preface and dedication to Lord Ashley. The book was never completed, but Locke's preface is preserved amongst the Shaftesbury papers at the Public Records Office. This manuscript clearly shows that Locke sought Sydenham's assistance in treating outbreaks of smallpox in the Ashley household. " At least, my lord," writes Locke in his friend's name,

> I thought it reasonable to let you see that I had practised nothing in your family but what I durst own and publish to the world, and let my countrymen see that I tell them nothing here but what I have already tried with no ill success on several in the family of one of the greatest and most eminent personages amongst them.[3]

Evidently their association progressed beyond assisting one another in practice, as some of Locke's medical writings are annotated by Sydenham. Unfortunately these medical essays were never completed, but one entitled " Anatomia " was (judging from the context) to have been preceded by further observations by either Locke or Sydenham. Apart from the following sentence by Sydenham squeezed at the top of the first page, the remainder is in Locke's handwriting.

> Others of them have more pompously and speciously prosecuted the promoting of this art by searching into the bowels of dead and living creatures, as well sound as diseased, to find out the seeds of discharging them, but with how little success such endeavours have been and are like to be attended, I shall here in some measure make appear.[4]

In another of Locke's essays, called " Tussis," is the following marginal note in Sydenham's hand:

> Here the cures done by riding are to be brought in, in reference to cure of consumptions and morbi obscuri.[5]

It can, therefore, be established that Locke accompanied Sydenham on his professional visits, which served to stimulate his powers of clinical judgment and observation; likewise Sydenham assisted Locke in his small

[2] Boyle, Robert. *Works* (1744), vol. V, p. 567.
[3] Shaftesbury Papers, series viii, no. 2, P. R. O.
[4] *Ibid.*
[5] *Ibid.*

practice. Furthermore Sydenham corrected and annotated Locke's medical manuscripts, and in return the latter took a lively interest, and at times played an active part, in Sydenham's medical writings. Their collaboration had reached its most active phase in the year 1670 when Thomas Sydenham dispatched the following rough draft of his observations on an outbreak of dysentery to his friend Locke. This manuscript (hitherto unpublished) was found amongst a large collection of Locke's letters and notebooks which have recently been acquired by the Bodleian Library, Oxford. This rough draft, with its many alterations and footnotes, is of interest in that it is one of the few examples of Sydenham's original manuscripts.[6]

A Dysentry.[7]

The year 1669 + hath produced the same feaver with those of the years 67 and 68 and the cure which I adapted thereunto hath been the same which before I mentioned to be employed about the curing of those. But about August this yeare *gripeing* (2) in the bowells without stooles, chol*era* (6_1) morbus,[8] and dysentry bicame very epidemicall (2).

Le cholera morbus was by me cured according to the method I have published.

The gripeing of the bowells I cured after the same manner as I did the Dysentery of which I shall here treat.

I observe this disease come in for the most part about the beginning of Autumn. It is sometimes accompanied with a feaver and sometimes without but always with great torment in the bowells upon going to stoole with frequent dejections and those for the most part not stercorus but mucous with which are mixed streaks of bloud in the beginning, but in the farther progress of the disease bloud in larger quantities and unmixed often is evacuated (3). Upon the continuance of this disease the intestines seeme to be affected successively downwards until the whole mischief be terminated upon the rectum in a tenesmus wherein contrariwise than during the

[6] MS Locke, C. 29, fol. 19, Bodleian Library.

[7] There are some difficulties in transcribing Sydenham's manuscript. In the first place, his handwriting is difficult to decipher; there are many alterations, and odd notes are stuck in the margins and others at the end of the manuscripts. The manuscript is made more difficult to follow as Sydenham seems to disregard punctuation and his spelling of simple words varies from line to line.

Sydenham himself appears rather confused with his own footnotes. As will be noticed, no. 1 is lacking, and note 6 is intended to be linked with 6_1.

[8] Although there is a number "1" above "cholera," a corresponding note 1 is missing. Since reference to note 6 seems to be implied, a corresponding alteration has been made.

dysentey the stooles which prove stercorus cause the greatest paines in the bowells, those faeces grating upon the yet tender guts in their passage downwards, and the mucuous stooles only troubling the lower gut, whilst they are excreting and provoking frequently to stoole. This disease provided it be not duely managed (6) is for the most part mortall to old persons, less fatall though yet very dangerous to youth but benign enough to infants, who if let alone and not tampered with may have it for some months without any prejudice of their lives. The Irish dysentery is not here meant with the nature and manner of which I am unacquainted but they which happened in our own country (4).

This is therefore the way of cure. If the patient be in his flourishing age and hath a feaver take bloud from his arm an hour or 2 after which take the following course. Take 4 gallons of whey, let the patient drink thereof in so great a quantity as by overcharging his stomach to vomite up what he hath drunke and let him do the same successive till he hath drunk 3 gallons and let the rest be put up by way of clyster without the addition of sugar or anything else only a little but warm, 6 or 7 times one after another, putting up a fresh one as soon as he hath rendered the former. The clysters may be given between while as he is vomiting, his gripes will cease and his bloody stooles likewise after the 4th clyster. As soon as *the* whey is all out of his body, and *'he* hath gone through this course which is done in 3 or 4 hours if closely followed let him go to bed and in a little while he will of his own accord fall into a gentle breathing in which he must be kept 24 hours at least drinking nothing in the meantime but raw milk a little warmed and for 3 or 4 days likewise after he riseth he must take nothing else either for meat or drink. If from rising too soon or intermitting his milke diet he relapse he must take the same course again and be wiser next time.(5) When there is no feaver accompanying this disease it will not be necessary to take blood before the use of the whey, especially in ancient people, whereas if there be a feaver bloodletting is so altogether requisite that without it the drinking of whey and all the following means would be wholly ineffectuall.

This course always succeeded (provided the disease was not come to a tenesmus) during the heat of the yeare, but when the weather came to be cold administration could not be used without more inconvenience though it brought less certain advantage to the patient, and I was therefore fain to substitute this other following method of curing. I gave the patient a moderate astringent purge two mornings following and the night after each purge a gentle narcotik.

If the patient be an infant that hath this disease let him be kept to raw milk only and let nothing else be done till he be well.

But if the disease be turned into a Tenesmus the patient will be inforced to submit unto the disease untill by the use of a nourishing diet and now and then some cordials likewise his strength come on, proportionally to the attainment whereof this symptom will vanish of its own accord.

Upon the invasion of winter and very hard weather the cholera morbus gripeing of the guts and dysentery above mentioned totally ceased and instead of them the small pox (which in the summer of this year as it had done in the same season of the preceding year was almost gone) returned again and became more rife in which posture it continues at the writing hereof viz the beginning of the year 1670.

Ex attenta et felice observatione

Thomas Sydenham.

Notes

\+ The foregoing part of the summer having proved very hot and dry and the blood and humors thereby having arrived to a great adustion and sharpness.

(2) of which there had scarce been any sprinklings for about 10 years in this place.

(3) to the great hazard of the patients life if not the certainty of the loss of the same, this large bleeding especially if unmixed with mucous matter being an argument of the great corrosion of the vessels of the intestines.

(4) I judged that the curative indication was altogether to be directed to the diluting and contemprating the sharp humours that were excreted for the most into the bowells,[9] as likewise to diluting and contemprating the bloud its self the source of this mischeife.

(6_1) that the bowels by the great inflammation from the afflux of the morbific matter to the pained part are often irrecoverably gangrened besides that as hath been observed often times through great corrosion of the vessels in the long bearing downe of sharp humours upon them whereby a great evacuation of bloud is caused, as considerable a danger is caused.

(5) This way of cure will not be thought less expeditious and certain than courses usually prescribed are both tedious and dangerous, when the world valuing learning for that only therein which is

[9] I am not quite sure about this passage.

necessary for the good of human life shall think as well of him that taught to cure disease as those that taught to discourse learnedly about them—et extinctus amabitur idem.

(6) This disease provided it be not quickly cured is not only full of torment but likewise very dangerous to the patient whose smaller stock of vital heat and spirits will be carried of with his frequent dejections before the peccant matter in his blood can be excreted; and coldness of hands and feet coming on he will be in danger of dying within the period of acute disease as likewise that the bowells by (6_1).

Some six years after Sydenham wrote these notes to John Locke he enlarged and recast his earlier book on fevers which reappeared under the new title of *Observationes medicae*. In this later work Sydenham's treatment of dysentery differs from that recommended in his rough draft to Locke. Here he suggests bleeding followed by daily purges together with opiates every morning. The diet consists of mutton broth and "milk boiled with thrice its quantity of water, or the white decoction, . . . made of burnt hartshorn and the crumb of white bread." [10]

In the preface of *Observationes medicae* Sydenham acknowledges his indebtedness to his colleague Locke.

> You know how thoroughly my method is approved of [writes Sydenham], by an intimate and common friend of ours, and one who has closely and exhaustively examined the subject—I mean Mr. John Locke, a man whom, in the acuteness of his intellect, in the steadiness of his judgment, and in the simplicity, that is, in the excellence of his manners, I confidently declare to have amongst the men of our own time few equals and no superior.[11]

This extract from *Observationes medicae* shows (as also does the correspondence between them) that Sydenham greatly valued Locke's clinical judgment and that their friendship continued during the latter's travels abroad. On Locke's return to England they resumed their collaboration. Evidence for this is to be found in a Bodleian manuscript in Locke's handwriting entitled, "Extracts of Sydenham's Physic Books and Some Good Letters on Various Subjects," [12] which was edited and published by Dr. Greenhill as *Anecdota Sydenhamiana* in the mistaken belief that the

[10] *The Entire Works of Dr. Thomas Sydenham*, transl. John Swan (1753), p. 160.
[11] Sydenham, Thomas. *Observationes medicae* (1667), p. 4.
[12] Rawlinson MS, C. 406, Bodleian Library, Oxford.

work was entirely Sydenham's. This error was first pointed out by Mr. Fox-Bourne and later confirmed by Sir William Osler.

The manuscript is partly in English and partly in Latin: according to Payne (Sydenham's biographer) Locke was probably responsible for the Latin portions, whereas the English extracts were either copied by him from Sydenham's manuscripts, or were dictated by Sydenham to Locke, as nearly all the subject matter has been reproduced elsewhere in the great physician's published works. Traces of Locke's own work are to be found in an investigation dealing with an aspect of public health in which the philosopher-physician endeavours to correlate the mortality rates of various foreign capitals with the meteorological findings at different seasons of the year. As many of these extracts are marked "ex ore Syd," and are dated 1682 and 1683, they provide indisputable evidence of the collaboration of these two physicians after Locke's return from France. In addition to this letter on dysentery, the Locke manuscripts contain other evidence of their collaboration such as a subject index to *Observationes medicae*, as well as Sydenham's rough notes on smallpox, pleurisy, intermittent fevers, and other medical topics.

But why, it may be asked, should Thomas Sydenham, the greatest physician of his day, send his medical notes to Locke who, although also a physician, achieved just and lasting fame as a philosopher? A perusal of Sydenham's original writings seems to offer one clue to this problem. Such of his manuscripts and letters which are still extant are written in English in a simple yet robust style; yet all Sydenham's works were first published in ambitious and rhetorical Latin. Moreover there is some evidence to show that Sydenham's knowledge of Latin was inadequate for the purpose of writing medical textbooks; although he was doubtless capable of reading works in that tongue. This is understandable as his undergraduate studies, which had been rudely interrupted by the Civil War, were meagre. The first definite statement that Sydenham wrote in English and had his manuscript translated into Latin comes from Henry Stubbe who rudely comments:

> 'Tis true he did not pen it in Latin, but another (Mr. G. H.) for him; and perhaps his skill in that tongue may not be such as to know when his thoughts are rightly worded.[13]

Likewise, in his *Lives of the Professors of Gresham College* Dr. John Ward asserts that Sydenham's books were first written in English and later translated into Latin by Dr. Mapletoft and Mr. Haver. The Rev.

[13] Payne, J. F. *Thomas Sydenham* (1900), p. 214.

John Mapletoft, son of the physician, in corroborating this statement, added that his father claimed to have translated all Sydenham's works prior to 1683 which includes all his books except *Schedula monitoria* which is said to have been translated by Mr. Havers.

On the basis of the long and intimate friendship between Locke and Sydenham, together with the fact that they had previously collaborated in writing medical treatises, it is now suggested that John Locke also had a hand in the shaping of *Observationes medicae* of which these notes on dysentery, reproduced above, are Sydenham's rought draft forwarded to his friend and medical colleague for revision, and possibly for translation into Latin. In this connection it must be remembered that Locke was not only a physician, but also a classical scholar of some merit, who had previously held successive lectureships at Christ Church in Rhetoric, Greek, and Moral Philosophy.

Sydenham, on the contrary, had no pretensions to classical scholarship; he was essentially a practical man who resolutely endeavoured to study natural facts by pure observation; at the same time he cast aside the many theories of more learned physicians, whose books he forthrightly dismissed as having "as much to do with treating sick men as the painting of pictures has to do with the sailing of ships." [14]

However, the fact that there is much circumstantial evidence to show that Locke assisted Sydenham in his writings should in no way detract any merit from the great physician's works. There can be little doubt that Sydenham, "one of the master builders at this time in the commonwealth of learning," as Locke calls him, was the leader in the field of clinical medicine. It seems likely that Locke's help was mainly of a literary nature for long after Sydenham's death Locke cherished the memory of his colleague and held his work in high esteem.

"That which I always thought of Dr. Sydenham living," Locke writes to Dr. Molyneux, "I find the world allows him now he is dead, and that he deserved all that you say of him. I hope the age has many who will follow his example, and, by the way of accurate practical observation, which he has so happily begun, enlarge the history of diseases, and improve the art of physic, and not by speculative hypotheses fill the world with useless though pleasing visions." [15]

[14] *Ibid.*, p. 137.
[15] Fox-Bourne, H. R. The *Life of John Locke* (1876), vol. II, p. 243.

THE MEDICAL PROFESSION AND PATENT AND PROPRIETARY MEDICINES DURING THE NINETEENTH CENTURY

DAVID L. DYKSTRA

The patent-medicine business was not a new venture on the part of the post-Civil War Americans, nor was the issue of patent medicines a new problem to be solved in the latter part of the nineteenth century. Colonial Americans were familiar with and had become dependent on the proprietaries which had become exceedingly popular in England early in the eighteenth century. Professor Urdang indicates this dependency on the part of the early Americans when he states that " to the busy settler, with little time and small means, these ready-made and not too highly priced remedies seemed to solve at once all the problems of medical and pharmaceutical help, of convenience and even of finance arising in case of sickness while the daring advertising of that time appealed to his simple and optimistic mind." [1]

During the nineteenth century medicine made considerable progress but still remained largely a mixture of science, quackery, and tradition. In spite of the importance of the achievements in sanitary reform, the public was not inspired with any great confidence in medical science and attributed the reforms more to engineering improvements than to the practice of medicine. In the early decades of the nineteenth century learned physicians relied on the favorite remedies and cures that had been used in the past. Fear of " evening damp " and " twilight chill " prevented enjoyment of the night air; newly plowed lands were thought to cause fevers; and the common custom of bleeding patients usually sapped their remaining strength. Calomel and Peruvian bark (quinine) were favorite and often used remedies.

The Americans, in their desire for relief and in their ignorance, were highly susceptible to all forms of medical propaganda. The policy of the legitimate medical profession to refrain from any sort of advertising left the field open to quacks, faddists, and patent-medicine manufacturers to exploit the public with all sorts of " fake-cures " and nostrums. It was very natural for the ailing pioneer, not obtaining help from home remedies

[1] George Urdang, " Pharmacy in Colonial North America," *The Merck Report*, 56:7 (April, 1947).

or local physician, to turn to the nostrums and "place his trust in the certain promises of the marvelous elixirs, extracts and balms which came in bottles and pills." [2]

In the crusade to regulate and control the patent-medicine industry, the medical profession played the leading role. However, it was not until the turn of the century that this profession, led by the American Medical Association, aroused itself and became the chief opponent of the nostrums. Throughout most of the nineteenth century, except for an occasional attack on the "cure-alls," the profession did very little to expose this phase of medicine. In fact, most of the medical journals advertised the nostrums and a majority of the physicians prescribed them.

During the nineteenth century, because of the problems of medical training and in consequence of the striking progress in the field of chemistry, the physician necessarily became separated from the pharmacist. The physician had to devote himself to the study of the action of the remedies and to their uses, the pharmacist to the study of the different pharmaceutic preparations.

As a consequence of these and other changes, pharmacy made such great progress that the dispensing pharmacist no longer sufficed for the preparation of all chemical products. A division thus took place, establishing dispensing pharmacists (druggists) and manufacturing pharmacists. Some of the manufacturers were true pharmacists. Others were nothing but merchants who, seeing some money in drugs, tried to take preparations away from the pharmacist simply for profit.

These social, commercial, and scientific developments made it necessary to have factories limited to the preparation of remedies which could not be prepared in an ordinary drug store without the help of steam machinery and other appliances. Manufacturers of these remedies tried to secure protection for their product so that others could not manufacture the same article or at least put the same article on the market under the same name. Protection was afforded to them in two ways: by means of a trade-mark or by means of a patent. The patent protected the owner, or discoverer, in the manufacture of the medicine for a period of seventeen years. These preparations were ethical, in fact they were not secret, for anyone for a small fee might obtain from the patent office of the government a copy of the description of the process of manufacture and the actual chemical composition of any such patented drug or remedy.

[2] Madge E. Pickard and R. Carlyle Buley, *The Midwest Pioneer: His Ills, Cures, and Doctors* (Crawfordsville, Indiana, 1945), 268.

It was a fairly common practice not to apply for patents for medical compounds, but in order to preserve the secret of the compound, to sell the article under a trade-mark. This class of manufacturers, usually referred to as medicine proprietors, thus did not possess a patent for any new invention or modification in the preparation of the remedy. They put on the market some compound with a strange name, preserving the secret of its composition and preparation. In this way the manufacturer was protected and he escaped the obligation of revealing the formula and the way of its preparation.

By the end of the nineteenth century manufacturers, retailers, advertisers, and promoters of various drugs and medicines openly competed with one another and with the medical profession in the diagnosis and treatment of disease. Through specious claims they enticed consumers to try advertised panaceas.

The proprietary business was of great importance to the average American druggist. Since most of the American physicians dispensed their own medicines, the average American druggist had never enjoyed a large prescription business. The situation is best illustrated by the fact that when in 1900 a law in Missouri excluded the registration of physicians as pharmacists until they had passed the pharmaceutical examination, a privilege previously granted to them, "2,242 physicians registered before the new law went into effect."[3] In 1902 an inquiry, answered by 41 retail druggists in Illinois, showed that "in seven cases the physicians write prescriptions, in sixteen they dispense their own medicines and in eighteen they do both."[4]

Self-interest spurred the medical profession and druggists in their fight with the patent-medicine industry. During the nineteenth century there was fear that the competition from this source would undermine the position of these interests. There were various investigations of patent medicines and patent-medicine men by the local societies, often leading to their expulsion from the profession.

The American Pharmaceutical Association devoted considerable time and space to the discussion of problems connected with the manufacture and sale of patent and proprietary remedies. A review of the proceedings of the Association suggests the rather interesting fact that this agitation appears to have developed in cycles. The *Proceedings* for 1853, the second

[3] *Proceedings of the American Pharmaceutical Association*, 48 (1901) : 462.

[4] *Bulletin of Pharmacy*, 16 (1902) : 100. Cited in Edward Kremers and George Urdang, *History of Pharmacy: A Guide and Survey* (Philadelphia, 1940), 297.

meeting of the Association, contains the following resolution which was adopted by a majority of the members present:

> Resolved, That the American Pharmaceutical Association believes that the use and sale of secret or quack medicine is wrong in principle and is in practice attended with injurious effects to both the profession and the public at large, and believes it to be the duty of every conscientious druggist to discourage their use.
>
> Resolved, That this Association earnestly recommend to our pharmaceutical brethren to discourage by every honorable means the use of these nostrums; to refrain from recommending them to their customers, not to use any means of bringing them into public notice; not to manufacture or to have manufactured any medicine, the composition of which is not made public; and to use every opportunity of exposing the evils attending their use, and the false means which are employed to induce their consumption.[5]

The agitation in the next decade was largely centered about the manufacture of fluid extracts and the development of proprietary rights in preparations of this type, and ten years later a similar line of activity developed in connection with elixirs, which at that time were very popular. In the 1880's, however, the attention of the members of the Association was again directed to patent medicines of the nostrum type by a resolution offered by Professor A. B. Prescott, of Ann Arbor. This resolution suggested that a committee of three members be appointed to "agree upon the most feasible and suitable legislation to secure a sufficient statement of the composition of proprietary medicines on the package of the same and more feasible and efficient action to be taken by the Association in regard to the matter." The committee, which was appointed, offered in its report a resolution which was subsequently adopted by the members of the Association present, to the effect "that it is the deliberate opinion of this Association that the labels of proprietary medicines ought to carry a statement of their constituents." [6]

In spite of the endorsement given the report, little or nothing of a practical nature appears to have been done. During the early years of the succeeding decade a few isolated papers on patent-medicine abuses, from a public health point-of-view, were presented but did not arouse much interest and much of the time of the Association was devoted to the discussion of a plan or plans to remedy the "cutting of prices." [7]

At the semi-centennial meeting of the American Pharmaceutical Asso-

[5] *Proceedings of the American Pharmaceutical Association*, 1853, 17.

[6] *Ibid.*, 33 (1885): 394-8.

[7] For a discussion of these plans to remedy the "cutting of prices" see Kremers and Urdang, *History of Pharmacy*, 297-303.

ciation, in 1902, several papers were again presented bearing on existing abuses in connection with patent and proprietary remedies. These papers dealt principally with the abuse of proprietary medicines and their use by physicians, and perhaps contributed somewhat to the renewed interest on the part of the American Medical Association in matters relating to the use of secret or semi-secret remedies by medical practitioners.

The attitude of one group of pharmacists on the patent-medicine question was expressed by Dr. W. C. Anderson in a debate at a New York meeting of pharmacists in 1906. Physicians, he pointed out, want the pharmacists to throw out all patent medicines. This, he continued, the pharmacists are not willing to do. Anderson maintained that patent medicines filled an important economic role, since for the more common ailments and particularly with the poorer people they were in demand and the pharmacists could not in justice to the public cast them overboard. He concluded that the most the pharmacists could do and all they should be expected to do was to refuse the sale of harmful and fraudulent articles. "To ask us to go farther than this would be to ask us to sacrifice the interests of the people for the selfish benefit of physicians." [8]

Practically the same attitude was expressed that year by Charles F. Mann in his presidential address before the National Association of Retail Druggists. Referring to the numerous patent-medicine bills which had made their appearance in State legislatures, Mr. Mann declared that "if retail druggists had aided in defeating many of these unjust and unreasonable measures they have, in my opinion, only done their plain duty." [9] This, to a certain extent, was in the nature of a reply to the charge of the American Medical Association that the druggists of the country had supported the patent-medicine men in attacks upon bills introduced by physicians in the interest of public health.

The American Medical Association almost annually, from the time of its preliminary meeting in the city of New York, in 1846, to its reorganization at Saratoga Springs in 1902, adopted resolutions condemning nostrums and secret remedies of all kinds and pointed out objectionable features connected with them.[10] This was particularly true during the

[8] *Bulletin of Pharmacy*, 21 (1907) : 446.

[9] *Ibid.*

[10] In 1891 Dr. L. W. Flanders, addressing the Vermont State Medical Society, stated: "I have ventured to bring this subject [Patent Nostrums] before you because I have never heard it discussed at a medical meeting. . . . So far as I know, there has never been any decided movement made on the part of the profession toward discussing the patent-medicine frauds with which the country is filled. There have been one or two journals

last decade of the nineteenth century when the medical profession was beginning to be increasingly aware of its responsibility in the promotion of proprietary medicines.

However, the question of what should be the attitude of the medical profession toward proprietary remedies was not a simple question and could not be answered with either a sweeping endorsement or a sweeping condemnation. There were proprietary medicines which were used effectively as household remedies. There were others which constituted a shrewd combination of drugs and which brought their manufacturers returns in wealth entirely disproportionate to the common place skill and knowledge required in their composition. Then there were others which owed their success to the skill with which they were advertised and to the gullibility of both the public and the medical profession. Still others were thoroughly dishonest.

The vast majority of those writing in the American medical journals during the last two decades of the nineteenth century did not discriminate between legitimate pharmaceuticals, the method of production of which was well known and to which no secrecy was attached, and those secret nostrums which were not produced for the physicians' use but went directly to the public. There was a tendency to classify legitimate and valuable preparations, made by reputable pharmaceutic houses, with quack nostrums and other types of fraud.

The agitation by the medical profession in the early part of the nineteenth century had resulted in the adoption of a national pharmacopoeia, the first issue of which was published in 1820. It was the work of physicians and was brought out by them for the guidance of pharmacists. Since 1820 the *Pharmacopoeia* has been revised at ten-year intervals by a convention of physicians and pharmacists which formulated policies and by a revision committee made up of physicians and the representatives of pharmacy and allied sciences. While the *Pharmacopoeia* furnished standards which were accepted by a few as authoritative, it was, after all, but an advisory instrument and was followed or ignored as it suited the manufacturer.

The *Pharmacopoeia* only partially improved matters, and society transactions continued to contain records of criticisms of the prevailing conditions. So it went on until the organization of the American Medical

started with this object in view, but they have failed for lack of support on the part of the public, and the violent opposition of the manufacturers of these secret preparations." *Transactions of the Vermont State Medical Society*, 1891, 44-7.

Association. At its first meeting (1846) resolutions were adopted which indicated that the question was still a vital one. So, again in 1849, 1850, and every year or two thereafter this subject was discussed. Then, however, it was the unreliability of drugs that was the chief source of irritation, the proprietary medicine abuse not yet being so much in evidence. But in 1879 the Association paid its respects to this "modern curse." In the *Transactions* for that year we find the following:

> Whereas, of late years many drugs and combinations of drugs bearing copyrighted names have been placed on the market and especially introduced to the notice of physicians, and
>
> Whereas, such drugs and combinations of drugs having copyrighted names, are advocated in the medical journals of the country, be it
>
> Resolved, That the use of articles thus protected by copyright and the promoting of their use by advertising them in medical journals is a distinct violation of Section 4, Article 1, of that portion of the Code of Ethics treating on the duties of physicians to each other and to the other profession at large, and also of Section 4, Article 1, of that portion of the Code of Ethics treating on the duties of the profession to the public and of the obligations to the public of the profession.[11]

From that time on scarcely a year passed that the Association did not take some action regarding the proprietary-medicine problem. Finally, when *The Journal* took the place of the annual *Transactions* it became, on account of the advertisements, a very practical question.

The proprietors and the patentees were endeavoring to show by every means the alleged superiority of their articles and the efficacy of their productions. In order to accomplish this the proprietary interests employed various tactics. One of the most important of these was to introduce the remedial preparation to the medical profession, then it would "go" among the public. Advertisement was made in the daily press, in the medical journals, or by sending samples of the preparation to the physicians accompanied by some medical reports.

Advertisement of remedial articles in the medical journals showed the desire of the better manufacturers and proprietors to deal directly with the medical profession. However, the medical journals were easily brought to accept advertisements which were not entirely in accordance with the code of ethics of the American Medical Association. Some of the medicine proprietors had their own medical journals, with very little reading matter, but with large quantities of advertisements. These journals were usually sent free to the doctors in order to persuade them

[11] *Transactions of the American Medical Association*, 30 (1879): 45.

to use their productions. Young doctors were requested to write articles on the value of some particular medicinal preparation accompanied by a report of a few cases perfectly cured by the use of the remedy. These little reprints were then sent to the doctors with the samples, in order to impress their value on them.

During the year 1899 a university professor of medicine collected and collated this type of medical matter, that he received through the mail, with the following results:

> He received by mail 424 circulars relative to medicines and their uses. Of these there were only 54 which he was able to class as "respectable." By respectable is meant that "the application of the remedy was first made by a physician, and the results obtained were reported in a medical journal or to a medical society. The firm in question announces the manufacture of this drug with reprints of original articles as recommendation." . . . The remaining 370 pieces he divides into "ordinary" and "disgusting," which terms he defines as, "the first consisting of weak journal articles written to praise the remedy in question, considerable commendation by the manufacturer, with numerous letters of recommendation from physicians who have tried the remedy." In this class, "ordinary," alone there were found letters from 1786 physicians, 56 editors of ten-cent medical journals, and 119 professors in mushroom medical schools. The third class were weak and generally disgusting in nature relating largely to disease of the mucous membrane. "The flavor of this extraordinary group is decidedly that of the yellow press, and they disgrace the medical profession by having so many of its members falling low enough to be identified with them." [12]

Even as late as 1906 the majority of American medical journals were not unfavorable to proprietary medicines—at least not to the extent that they refused to accept their advertising. Dr. J. H. Salisbury presented the results of a study of the advertising columns of the American medical journals in a symposium on proprietary medicines and nostrums before the Chicago Medical Society. This study showed that practically all medical journals carried advertisements of proprietary remedies. "In one journal which is supposed to exhibit the highest ideal in the ethical conduct of medical journalism, 20 out of the 36 advertising pages were devoted to advertisements of proprietary articles; in another of high grade 9 out of 26 pages were used in the same way." Dr. Salisbury went on to explain that the medical journals not only aided the proprietary medicines through their advertising columns but that a large proportion of the medical journals also had a department devoted to advertisements

[12] Henry L. Swain, "The Attitude of the Profession Toward Patent Medicines and Appliances," *Yale Medical Journal*, 8: 167-176 (December, 1901).

under the guise of reading notices, commercial news, and therapeutic notes. A number of journals went so far as to put such material under the heading of "Abstracts" and printed so-called "select original articles" culled from other journals.

Dr. Salisbury became more specific when he stated:

> I went through 27 medical journals, covering the past six years, and found one preparation, viz., "peptomagan," as the subject of forty-five original articles. In addition there were six editorial endorsements of the remedy. In a somewhat cursory survey covering about 15 medical journals for the last 5 years, I have found about 300 so-called original articles written in praise of the various proprietary remedies, and the list is by no means complete.[13]

The movement to purify the medical press of the country of nostrum advertisements was first undertaken by the journals of the state societies. The Medical Society of the State of Pennsylvania [14] and the *California State Journal of Medicine* [15] took the leadership in the attempt to improve the quality of advertising in medical periodicals. In 1895 the Medical Society of the State of Pennsylvania brought a case before the Judicial Council of the American Medical Association against the advertising practices of *The Journal*. The Judicial Council discovered that the trustees and the editor had published some objectionable advertisements contrary to the resolution of the membership that advertisements should not be accepted for any secret proprietary remedies.[16] The Board of Trustees had found itself in a difficult position. It needed the advertising to pay for *The Journal* and therefore, despite the resolution of the membership, took as their standard what other journals were doing in regards to proprietary-medicine advertising.[17]

As a result of this move by the Medical Society of the State of Pennsylvania, which was led by Dr. Solomon Solis-Cohen,[18] the Board of

[13] J. H. Salisbury, "The Subordination of Medical Journals to Proprietary Interests," *J. A. M. A.*, 46: 1337-8 (May 5, 1906).

[14] Morris Fishbein, *A History of the American Medical Association 1847-1947* (Philadelphia, 1947), 168.

[15] Richard C. Newton, "Proprietary Medicines and State Medical Society Journals," *Journal of the Medical Society of New Jersey*, 2: 346 (May, 1906).

[16] Fishbein, *History of the American Medical Association*, 163.

[17] *Ibid.*

[18] Because of his stand on the matter, Dr. Solis-Cohen was attacked in a vicious letter published in *The Journal*, which indulged in personalities as to his race and religion. In later issues "Medicus" (the anonymous writer of the letter attacking Dr. Solis-Cohen) was condemned for conduct that was unethical. *J. A. M. A.*, 22: 438-9 (March 24, 1894). Solis-Cohen as early as 1892 was attacking patent medicines and

Trustees reported that the editor had been instructed to refuse advertisements of proprietary remedies which were not accompanied by a formula. The report continued:

> Still further to comply with what appears to be the desire of a large number of those interested in the highest success of *The Journal*, the editor, with the termination of present contracts, has been instructed to accept no advertisement of medicinal preparations, the proprietors of which do not give a formula containing the official or chemical name and quantity of each composing ingredient to be inserted as a part of the advertisement.[19]

These instructions were disregarded to such an extent that five years later, in 1900, the trustees of the Association found it necessary to again formulate certain rules regarding the admission of advertisements for the guidance of the editor and the advertising manager.

At the turn of the century various editorials and correspondence in *The Journal* indicated that some of the members of the medical profession were ready for a movement toward scientific standards in the prescribing of remedies. The forthcoming meeting of the Pharmacopeial Convention created more interest in these matters. An article by P. Maxwell Foshay, editor of the *Cleveland Journal of Medicine*, was devoted to medical ethics and medical journals. He called attention to the multiplicity of such publications which lived primarily on the support of proprietary medicines. "The greed for advertising patronage," he said, "leads the editor only too often to prostitute his pen or his pages to the advertiser, so long as he can secure the coveted revenue. So our journals are filled with articles and editorials containing covert advertisements of this and that remedy." He indicated that many of the proprietary medical houses would not advertise without a promise of reading notices and original articles in support of their remedies. The medical profession, he stated, was beginning to divide periodicals into honest and dishonest publications; Dr. Foshay urged physicians to patronize the honest periodicals and to write to the editors of dishonest ones asking them to stop sending such periodicals to physicians.[20]

The campaign against proprietary medicines gained ground when the first of a series of articles appeared in the issue of *The Journal of the*

the relations of physicians to them. See Solomen Solis-Cohen, "Shall Physicians become Sales-Agents for Patent Medicines?" *Proceedings of the Philadelphia County Medical Society*, 13 (1892): 213-6.

[19] Fishbein, *History of the American Medical Association*, 168-9.

[20] P. Maxwell Foshay, "Medical Ethics and Medical Journals," *J. A. M. A.*, 34: 1041-3 (April 28, 1900); Fishbein, 198.

American Medical Association for April 21, 1900. These articles were designed to correct the abuses in advertising and discourage the use of unscientific pharmaceutical preparations. The series included analyses and criticisms of such products as Castoria [21] and Syrup of Figs.[22]

At the meeting of the American Medical Association in New Orleans in 1903, a number of papers criticized medical journals for the nature and kind of advertising carried by them. A resolution was adopted by the section on Materia Medica and Pharmacy which condemned much of the advertising that was still being carried in *The Journal* of the Association. At this meeting of the Association provision was also made for pharmaceutical membership in the American Medical Association and the following June a number of pharmacists were elected to membership. These developments, along with the resolutions adopted at the convention were partially responsible for the inauguration of a Council on Pharmacy and Chemistry. The purpose of the Council was to inquire into the composition and standing of the several medicinal preparations of a proprietary character that were or would be offered to the medical profession. Then, by comparing them to the requirements embodied in a set of ten rules that had been adopted as a guide, it was to determine, as far as possible, whether or not the individual preparation and the firm or firms exploiting the same, were deserving of the patronage and confidence of physicians and pharmacists.[23]

A preliminary meeting of persons interested was held in Philadelphia on December 29, 1904, and the Council itself was organized in Pittsburgh on February 11, 1905. As it was first organized the Council consisted of twelve men divided into three committees—one on pharmacy, one on pharmacology, and one on chemistry. Therapeutics was added later. The men constituting the Council were active in different lines of scientific

[21] "Relations of Pharmacy to the Medical Profession," *J. A. M. A.*, 34: 1050 (April 28, 1900).

[22] *Ibid.*; Fishbein, 198.

[23] M. I. Wilbert, "The Council on Pharmacy and Chemistry of the American Medical Association," *The American Journal of Pharmacy*, 77: 182 (April, 1905).

C. S. N. Hallberg (Secretary of Council on Pharmacy and Chemistry) indicated that *The Journal of the A. M. A.* would not carry the advertisement of any article not approved by the Council. C. S. N. Hallberg to H. W. Wiley, January 5, 1906. In National Archives, Record Group 97, Records of the Bureau of Agricultural and Industrial Chemistry, Letters Received. "Beginning with the first of the year *The Journal* of the American Medical Association will carry no advertisement of any article not approved by the Council, which will also point the way for the journals of the state medical societies."

work related to medicine, and with this division of labor, it was possible to scrutinize an article very thoroughly.

The Council on Pharmacy and Chemistry was the subject of considerable comment in medical as well as pharmaceutical journals. Practically all of the journals that were not directly under the influence of proprietary houses of a questionable character endorsed the objectives of this Council. The *Apothecary* for April, 1905, expressed the opinion of the majority when in referring to the announcement of the Council, it stated that "it is fraught with vital interest to both the medical and pharmaceutical professions of this country, and is, we sincerely believe, the announcement of the beginning of a better order of things, when much that is unfair and dishonest and uncertain and unethical in the practices of druggist, physician and manufacturer will be cleared away." [24]

It was seen at the very outset that the work of the Council should not be limited to the study of medicines advertised in *The Journal of the American Medical Association* or those offered for advertising. It was agreed that the investigation should include all of the new articles advertised to physicians, the results of the investigations to be published in *The Journal* and later in book form under the title of "New and Non-official Remedies." Since the studies of the Council could not be extended to the thousands of products advertised in the lay press for the general public, as an almost necessary limitation, it was agreed that the studies and investigations of the Council should be devoted only to the articles advertised to physicians.

The articles concerning the "nostrum evil" appearing in the medical and pharmaceutical journals of the period contained many complaints and indictments against these remedies. These indictments by the pharmacists and physicians ranged all the way from the charge that many drunkards and drug fiends dated their downfall from the first dose of patent medicines to the accusation that "patent-medicine men try to make business by causing disease." [25]

Most of the indictments in the professional journals were of a general nature attacking the patent-medicine manufacturers, quack doctors, and the newspapers in league with both. The patent-medicine man was accused of preying on womankind, of failing to keep confidential women's letters but rather of publicly exploiting them, of exploiting, as a rule, the poor people, and of securing by fraud most of the patent-medicine testimonials.

[24] *Apothecary*, April, 1905.

[25] Champ S. Andrews, "Ways to Combat Evil," *J. A. M. A.*, 46: 1578 (May 26, 1906).

The nostrum makers were severely criticized for having a strong organization to protect themselves against hostile legislation of every sort. This organization—The Proprietary Association of America—represented 35 states. It looked after the interests of the patent and proprietary industry generally,[26] but its chief function was in regard to legislation. The legislative committee of the Proprietary Association consisted of 37 members, being several times larger than any other committee of the organization. The object of the committee was to watch national and state legislation which might affect the business interests of members and to take such action as occasion might require.

Besides the Proprietary Association, the public press was under attack by the medical profession for its interest in the nostrum industry. The medical spokesmen, ignoring the advertisements in their own journals, maintained that the patent-medicine evil could not thrive without the active support of a large part of the public press.

The indictments brought against the patent-medicine industry, also included the frequent charge that no knowledge of medicine was necessary in the patent-medicine business; that the patent-medicine "shark" hid behind a secret preparation; and that the patent-medicine man substituted impure and adulterated drugs for pure drugs. Then, there was a series of charges dealing with the remedies themselves and the tactics or ethics of the so-called "doctors." The patent-medicine men were charged with disregarding dangerous conditions and always recommending their particular remedy, knowing that it might be worthless or dangerous. Patients, it was stated, were frightened by fake analyses into believing they were dangerously ill. The medical profession accused the patent-medicine man of deliberately making false claims to the curative powers and to the universal applicability of his drug. The profession further charged that he exploited the personal skill of a physician who was generally an imaginary person. The remedies most frequently attacked were the catarrh cures and similar products which contained cocaine; the soothing syrups, cough remedies and other preparations which contained morphine and opium;

[26] Article II of the by-laws states the purpose of the Association:

"The objects of this association are: to protect the rights of its members to the respective trade-marks that they may own or control; to establish such mutual cooperation as may be required in the various branches of the trade; to reduce all burdens that may be oppressive; to facilitate and foster equitable principles in the purchase and sale of merchandise; to acquire and preserve for the use of its members such business information as may be of value to them; to adjust controversies and promote harmony among its members."

and some of the patent medicines which contained a maximum of alcohol [27] and a minimum of medication. Last of all the attacks were directed against the promiscuous manufacture and consumption of headache powders containing acetanilide.

Other physicians and medical writers were more interested in the secrecy of the patent ingredients of preparations for the treatment of the sick. Among the objections given were that intelligent use was impossible when the ingredients were kept secret and that secrecy induced the possible conclusion that the maker of the products was monopolizing the product for selfish reasons and that the actual cost of the product was entirely out of proportion to its sales price. Finally, that secrecy led to the temptation to employ patent ingredients to which objection might be raised if their presence were known to the consumer.

Others in the medical profession were interested in the causes for the use of these nostrums among practitioners at the turn of the century. Dr. Sterling Loving, in a paper read at a meeting of one of the local medical societies in Ohio in 1905 stated:

> Forty years ago the physician who prescribed a medicine without some knowledge of its composition and effects was considered to have violated the Code of Ethics and was regarded by his professional brethren with suspicion. There has been a great change. Now the practice of prescribing such medicines is not regarded as unethical and dispensing pharmacists assert that more than 20% of the formulae filled by them is for proprietary or patent articles.[28] [Dr. Loving continued:] The causes are not difficult to discover. Among them is the trend of modern teaching. Beginning with the impulse given by Virchow fifty years ago, research has in the main been directed to physiology, histology, pathology and etiology, and in those departments, pathological chemistry, and in surgery immense progress has been made. Meantime little attention has been directed to the art of healing. Not only has therapeutics been neglected, but disbelief in the efficacy of drugs is openly taught by some of the more prominent investigators and writers.[29]

It was not only Dr. Loving who attributed the use of patent medicines by the medical profession to modern medical education. Dr. C. F. Andrew,

[27] This evil, however, was greatly exaggerated especially by the writers condemning the "patents" in the lay press. They were entirely guided by the content of alcohol, regardless of the content of medicinal agents, and regardless, consequently, of the dose of the product and its virtual loss of alcoholic identity. Thus the comparisons of alcoholic strength between patent medicine on the one hand, and beers, wine and liquors on the other were "wide of the mark."

[28] Sterling Loving, "The Prescribing of Proprietary and Patent Medicines by Physicians," *The Ohio State Medical Journal*, 1: 82 (August 15, 1905).

[29] *Ibid.*

Professor of Materia-Medica and Therapeutics at the University of Colorado, writing in the *Denver Medical Times*, stated: "I firmly believe the paramount cause is lack of proper instruction in our medical school." [30] In the same article Professor Andrew maintained that the weakness in the training of the physicians was the "lack of proper teaching and therefore improper knowledge in materia-medica and therapeutics." [31]

Dr. Frank Billings in a paper read in the Section on Practice of Medicine of the American Medical Association at the 56th annual session (1905) also stated that the cause of the nostrum evil was the fact that "pharmacology and therapeutics are neglected relatively by many of our medical schools." [32]

The medical profession was upbraided for its medical education even by its friends outside the profession. Dr. Harvey W. Wiley of the Bureau of Chemistry stated:

> I fear it is too much the practice in modern medical education to neglect some of the fundamental principles which it seems to me every physician should master; namely, the principles of medical chemistry, of pharmacy and of therapeutics. . . . We all know it is much easier to say to a patient, instead of writing a prescription, "go to a drug store and get a bottle of" such and such a remedy; that requires no attention, no study, and no care. But that is not practicing medicine—that is aiding the sale of proprietary remedies.[33]

Other causes given for the use of patent medicines among practitioners were: the type of treatment that was encouraged by the formula treatment in the hospitals and dispensaries and other places of medical supervision, and the susceptibility of the busy and ignorant physicians to listen to the "beautiful" lectures on diagnosis and treatment. These lectures were given by some voice that had learned them from a printed slip sent throughout the United States to the different branch houses and representatives to "teach and educate us poor and insignificant dispensers of their nasty nostrums." [34]

The professional journals indicate that many physicians were interested in lessening or destroying the nostrum evil as well as in pointing out its implications. They were discussing the question of "secret" vs. "non-

[30] C. F. Andrew, "The Physician's Use of Proprietary Medicines," *The Denver Medical Times*, 26: 185 (November, 1906).

[31] *Ibid.*, 188.

[32] Frank Billings, "The Secret-Nostrum Evil," *J. A. M. A.*, 45: 1702 (December 2, 1905).

[33] N. A., R. G. 97, Miscellaneous Papers, 371-2.

[34] Andrew, in *Denver Medical Times*, 26: 188.

secret" remedies and the reasons for the former's use by the profession. One approach to the evil, that was frequently suggested, was more publicity or information concerning the nostrums in the various professional publications and lay press. It was suggested that an arrangement be made by which a continuous series of articles would be written for publication in the leading medical journals of the country. These articles should specifically and unmistakably set forth the dangers of advertised nostrums. Later these same articles should be published in the daily newspapers and literary magazines, in the form of standing advertisements if need be.[35] The medical profession also proposed plans to inaugurate in every city a course of lectures to show the evils of indiscriminate medication through patent nostrums, "making the object lessons plain and forceful, and placing the lecture course on a popular basis."[36]

Many writers maintained that the medical schools and medical journals should do more to educate physicians regarding official preparations and proprietary articles whose composition was known and of proved usefulness. They stated that more emphasis should be given in the training of medical students to the science and art of pharmacy, including prescription writing.[37]

Any plan or action adopted by the profession against the patent medicines, according to many of the physicians, should include these lines of attack: (1) Cooperative efforts on the part of physicians and scientific pharmacists should be encouraged; (2) Continued exposure of patent-medicine and nostrum methods and the disclosure of the composition of these preparations by the lay and medical press to the public was urgently needed; (3) The creation of a professional sentiment to the effect that trade-marked nostrums are unworthy of being prescribed; (4) Attempts to emancipate a "shackled" medical and lay press should be persistently maintained; (5) The textbooks on physiology and hygiene in the schools should have some space devoted to the dangers of patent medicines and indiscriminate dosing; and (6) The organization of a Society for the Preservation of the Public Health for the specific purpose of fighting against patent medicines.[38]

[35] William P. Spratling, "Nerve Nostrums and Their Dangers," *J. A. M. A.*, 40: 570 (February 28, 1903); W. S. Fullerton, "The Objectionable Influence of Proprietary Medicines Upon the Young Practitioner," *The Journal of the Minnesota State Medical Association and The Northwestern Lancet*, 26: 447-9 (October 15, 1906).

[36] *Ibid.* See also Billings in *J. A. M. A.*, 45: 1703; and J. M. Anders, "The Patent Medicine and Nostrum Evils," *J. A. M. A.*, 46: 268 (January 27, 1906).

[37] Anders, *J. A. M. A.*, 46: 270.

[38] C. S. Andrews, *J. A. M. A.*, 46: 1575-6; Anders, *ibid.*, 46: 270.

The medical writers also called attention to what the profession and other agencies were already doing in the fight against the nostrum evils. Among the various measures and methods mentioned were the organized efforts that had been instituted by the American Medical Association to expose the evils of the preparations, to determine their precise composition, and to show the extent of the harmful effects which they produce. Attention was called to the creation of the Council on Pharmacy and Chemistry by the Board of Trustees of the American Medical Association to examine the composition of the numerous and varied preparations that were constantly offered to the medical profession. They referred to the drug laboratory which was organized in the Bureau of Chemistry by the Secretary of Agriculture for the investigation of the purity, adulteration, false labeling, and false branding of drugs. The articles also emphasized the work that the agricultural department was doing for the postmaster-general in the investigation of certain secret remedies and nostrums as well as of the advertisements offered for transmission through the mails. Some of the lay periodicals, such as *The Outlook, The Ladies' Home Journal*, and *Collier's Weekly*, were cited and praised because they refused to accept such advertisements.

In addition to these attacks on the "patents," the opponents of the nostrums among the medical profession demanded more positive action and measures. The demand was made for legislation compelling all makers of proprietary articles to place the formula on the bottles and requiring that preparations containing poisons be labeled accordingly.[39] However, some opposed the "formula on the bottle" legislation. Henry B. Mason, speaking before the Section on Education and Legislation of the American Pharmaceutical Association at the Indianapolis meeting (1906), presented this view when he stated:

> The reformers want all formulae printed upon the label. I believe this is both unjust and un-necessary—unjust because it would compel the manufacturers to give away their trade secrets, and un-necessary because it would give the consumer, ignorant of drugs, no protection whatever. A fairer and also a more efficacious method would be to lodge all formulas in the hands of the State Board of Pharmacy or Health, or in the hands of the National Department of Health which it has been proposed to establish for some years, or in both. Then let these boards be given discriminatory powers; let them issue licenses to worthy products, and deny them to unworthy products.[40]

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[39] Anders, *ibid.*, 46: 268-9.

[40] *Bulletin of Pharmacy*, 20: 512 (December, 1906). Canada was attempting to work

Others maintained that more persistent efforts should be made to present evidence to the postal authorities, showing that patent-medicine men and quacks generally were using the mails for fraudulent purposes. Still others stated that evidence of the dangers of patent-medicine swindles should be systematically laid before the various state legislatures along with persistent demands for such legislation as was necessary to deal with the evil.[41]

Dr. Wiley, in a paper read before the American Therapeutic Society in 1907, pointed out that many of the persons engaged in the manufacture of patent and proprietary remedies were "wholly incompetent and ignorant of all scientific knowledge of pharmacy and therapeutics." He stated:

> You will be surprised to learn of the dense ignorance of many people who have appeared before the Bureau to call attention to the character of their wares which they have to offer. I believe that one of the most effective methods of the control of such remedies would be the requirement that no one be allowed to advertise or offer for sale in any community, any remedy of any kind, who has not passed an examination—and received a license to dispense medicines and prescribe for patients in the locality mentioned.[42]

It was not only elements of the medical profession which protested against the nostrums and attempted to do something to regulate and control them. The better class of proprietors, also, joined in the outcry against the "black sheep" among the proprietary articles and protested violently against being classed with them. The following letter from the J. C. Ayer Company, Lowell, Massachusetts, bearing the date February 12, 1906, signed by Charles H. Stowell, treasurer and general manager, and addressed to Frank J. Cheney, president of The Proprietary Association of America, indicates the attitude and approach of a few of the more reliable proprietors:

> Dear Sir:
>
> I hereby tender the resignation of the J. C. Ayer Company as a member of the Proprietary Association of America, the same to take effect at once. My reasons for tendering this resignation are two-fold:
>
> First, I believe that every bottle of proprietary medicine should have the full and complete formula, printed in plain English, as a part of the label.
>
> Second, I believe that the successful proprietary medicine of the future must have the support of the medical profession. The best medicine in the world can

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out a method similar to the one proposed by Henry B. Mason, who called attention to this fact in his paper.

[41] C. S. Andrews, *J. A. M. A.*, 46: 1576.

[42] N. A., R. G. 97. Miscellaneous Papers, 366-8.

never take the place of the family doctor. He comes nearer to his patient, learns more about the case, and is in every way better qualified to know what medicine is best. At the same time I believe that there is a place for good proprietary medicines. And I further believe that there is no reason in the world why a high-class effective, and in every way desirable proprietary medicine, with published formula should not have the endorsement of the medical profession, and become an ally to its best interests.

Holding these two beliefs very strongly, and knowing that this company stands almost alone in said beliefs, I feel sure that it would be better for the proprietary association, and also for ourselves, if we severed our connection with it.[43]

About the same time the Kress and Owen Company announced that it, also, had resigned its membership in The Proprietary Association of America.[44] This move by these two companies was later followed by others who disagreed with the general policy of the Association.

At the turn of the century the medical profession, although not wholly united in its stand against patent and proprietary medicines, was playing a major role in combating the evils involved in this industry. The medical profession, largely through the work of the American Medical Association with its state and local affiliates cooperated and strengthened those forces which brought about the inclusion in the Pure Food and Drugs Act of 1906 the provisions pertaining to patent medicines and habit-forming drugs. The American Medical Association, Dr. Wiley and the Bureau of Chemistry, the exposures of the patent medicines by *The Ladies' Home Journal* and *Collier's* were able in various ways to arouse favorable public opinion. In the end, when the public was fully informed as to the conditions that existed and the motives of the opposition, it was only a matter of time before a reluctant Congress would act to control and regulate patent and proprietary medicines.

[43] *The Druggist's Circular*, 50: 101 (March, 1906).
[44] *Ibid.*, 112.

ANTIQUE PEWTER OF MEDICAL INTEREST II*

T. G. H. DRAKE

In a previous communication (1) which appeared in this journal in 1941, various pewter articles of medical interest were illustrated and discussed. However, no collection is definitive and without getting to the stage of searching for "fly speck" varieties, at which stage of collecting the author admits, without shame, that he has arrived in postage stamps

Fig. 1.

A Bedpan, ca. 1792.
B Infant's bedpan, ca. 1800.
C Commode receptacle ca. 1790.
D Infant's chamber pot, 19th Century.

of child welfare interest, other pewter articles of medical interest have been acquired which it is felt should be recorded.

"The bedpan is so well known that little is requisite to be said upon it. One of pewter is to be preferred, as it is less likely to break or be injured, and it should have a flannel case to it" (2). Antique pewter bedpans (Fig. 1, A), bear a handle, the unscrewing of which reveals an opening,

* From the Research Institute, Hospital for Sick Children, Toronto, Canda.

about 1½ inches in diameter, into the bowl. Examples are rather uncommon. This scarcity is ascribable, in part, to the conversion in modern times into "antique rose bowls" by discarding the handle and filling in the aperture revealed by its removal. The manufacturers represented in our 3 specimens are Wm. Hogg, circa 1760, John Gardiner, ca. 1792, and Pitt and Dadley, ca. 1781. The individual maker's touches are accompanied by one or more of the "Crown and X," "London," and pseudo hallmarks. All specimens examined have borne a good series of marks

Fig. 2.

A Male urinal, ca. 1744.
B Female urinal, ca. 1800.

in clearer than average condition. The presence of good touch marks is probably the principal reason for the preservation of such non-glamorous articles. A small specimen with fixed wooden handle, ca. 1800, for use in infancy, is shown in Fig. 1, B. The handled bedpan was employed not only in bed but also as the receptacle in the "close chair." Fig. 1, C pictures a utensil for use in the commode. This specimen, very suitable in size and shape for present day use as a flower container, bears the pseudo hallmarks of William Bancke, ca. 1790. A child's chamber pot, 19th Century, of modern design, is shown in Fig. 1, D.

By those associated with hospitals, the article illustrated in Fig. 2, A,

will be recognized as a male urinal. It bears the Crown and X marks and the touch of Edward Toms, ca. 1744. This specimen was obtained at auction in London in a lot of " 3 pewter articles " consisting of this urinal, an ink well and a rather dilapidated jug. Since I am not a collector of pewter in general, happily the inkwell could be disposed of as a gift for utilization as a cigarette container while the pitcher was sold to an antique dealer. This transaction illustrates the complications of buying articles at auction. What can be done with the somewhat blurry modern hand telescope which is included in the lot with the antique pocket case of dental instruments for which one feels such a desire? A similar urinal together with a pewter enema syringe is shown in the caricature " The siege of Warwick-Castle " reproduced in an article by Stevenson (3). I have knowledge of only one other similar urinal. This, I am informed, was suspended on the living room wall, for use on occasion as a flower container, until the owner was informed of its real purpose when she hastily removed it. The female urinal, Fig. 2, B, ca. 1800, is of continental origin. It bears an angel as a touch mark, the owner of which has not been identified. Specimens quite similar in shape in sterling silver, Edinburgh, 1832, and Sèvres porcelain, ca. 1800, are in our collection. The latter specimen, finely decorated exteriorly with pastoral scenes, bears on the interior of the bottom a life-sized painting of a human eye. The broad humour of this " all seeing eye " is in keeping with that of the period.

Although syringes are not objects liable to be preserved as keepsakes, antique pewter specimens are not too uncommon. Pewter was the material of choice for manufacturing metal enema, urethral, etc. syringes during the 18th Century. It has been stated that a small syringe, pewter or bone, for intraurethral medication was a standard possession of the " man about town." Enemas were used in the treatment of most illnesses and were employed extremely frequently by the healthy. Pewter, even when buried, is quite resistant to decay. In syringes two or three hundred years old, discovered in the course of building excavations in the City of London, the plungers may be frozen yet the exteriors can be cleaned up to give a quite presentable appearance. Unfortunately, no syringe in our collection bears a touch mark, which marks are so valuable in dating pewter. In many 18th Century caricatures huge enema syringes are pictured, even of such size that the lackey accompaning the physician is represented carrying the syringe on his shoulder. In a Sèvres statuette, ca. 1800, marked " L'Apothicaire," Fig. 3, the pewter syringe in his

hands is huge by modern standards. However, that the size and weight of antique enema syringes as pictured in caricatures has not been exaggerated, as is frequently the case with pertinent features in caricaturing, is proved by the 18th Century pewter enema syringe, Fig. 4, A. The

Fig. 3.

L'Apothicaire, Sèvres statuette, ca. 1800.

length of this syringe with plunger extended, is 2½ feet, its weight 6 pounds. The diameter of the barrel is 4 inches, the hollow plunger is pewter, the packing a bit of rag. Smaller enema syringes, with wooden plungers, are shown in Fig. 4, B and C. The syringe in Fig. 5, of all metal construction with the long curved tip, is of the type illustrated by Witkowski (4) and described as being used in intrauterine baptism. In both specimens of this type in our collection, the tip is pierced with five pin point openings. Neither bears the tip piercing which has been reported

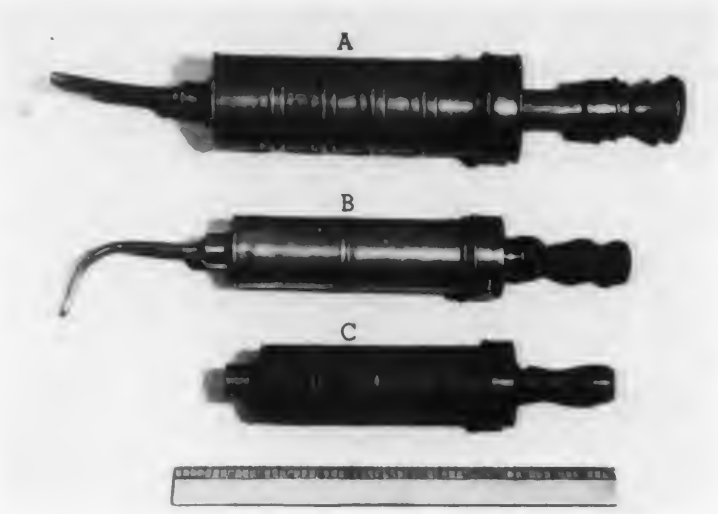

Fig. 4.
Enema syringes, ca. 1800.

Fig. 5.
Syringes, 18th Century.

in which the water is ejected through a cross-shaped aperture. The smaller syringes in Fig. 5 exhibit tips of varying size and shape. In all probability a high proportion of these were used for intraurethral injection.

Of 215 antique infant feeding flasks in our collection, 19 are pewter. Of these, 13 are pear-shaped and are of English, French, or Dutch origin. Types of pewter feeders not illustrated in the previous paper are shown in Fig. 6. The pear-shaped specimen A, bears a longer than ordinary tip.

Fig. 6.

Infant's feeding flasks and pot, ca. 1780.

The cylindrical example, B, bearing a greatly elongated tip, appeared at auction in London in one lot with the flask C, which is closed by a screw-on stopper fitted with a cork insert. From their occurrence together, and since the long nipple fits either equally well, it is reasonable to assume that the second flask is a spare feeding container. While pear-shaped flasks are the most common type in England and France, the conical variety, D and E, has been found to be the form most frequently encountered in Switzerland. F is a Dutch spouted feeding can of a type illustrated in old master paintings in use for feeding the small child. While in most examples the spout bears no terminal enlargement for firm attachment of a nipple, in this specimen the external diameter of the sucking tube increases slightly towards the tip. In the author's opinion, this Dutch

feeding can rather than Dr. Hugh Smith's English spouted feeder is the ancestor of the 19th Century Pennsylvania Dutch tin plate "Bubby Pot" infant feeder.

In *The Collectors Manual* by N. Hudson Moore, new edition, November 1953, 8vo., New York, Tudor Publishing Co., is illustrated and

Fig. 7.

Dr. Mudge's Inhaler, ca. 1788.

described, on pages *276-277*, a tankard-like object, a duplicate of the base of the inhaler shown in Fig. 7. While in reality an apparatus for steam inhalation, this is described by Moore as follows: "A unique piece of pewter is shown in the next figure, *297*, and bears on the front the words 'Mudge's Inhaler.' It is in the nature of a trick mug, for the handle is hollow with holes near the top, and if you do not put your finger over them the liquid spills." John Mudge was a physician of some

distinction, a Fellow of the Royal College and a Copley Medalist who practised in Plymouth. He was an intimate friend of Sir Joshua Reynolds, Dr. Johnson, and other eminent persons of his time.

His inhaler is illustrated and its use described in Mudge's book *A Radical and Expeditious Cure for a recent Catarrhous Cough*, 2nd edition, London, 1779, and its usage also is noted in *The Annual Register* for 1778, page 127, under the heading, "Mr. Mudge's cure for recent catarrhous cold." The account extends to several pages and Dr. Mudge begins by describing the causes and symptoms of the complaint before proceeding to the question of cure. For this he recommends the inhaling of steam into the lungs and to this end he has invented an inhaler which he describes as follows: The body of the instrument holds about a pint and the handle which is fixed to the side of it is hollow. There is in the lower part of the vessel, where it is soldered to the handle, a hole by means of which and of 3 others on the upper part of the handle, the water, when it is poured into the inhaler, will rise to the same level in both. In the middle of the cover a flexible tube about 5 or 6 inches long is fixed, with a mouthpiece of wood or ivory. Underneath the cover there is a valve fixed which opens and shuts to communication between the upper and internal parts of the inhaler and the external air, for a purpose which shall be presently described. When the mouth is applied to the end of the tube in the act of inspiration, the air rushes into the handle and up through the body of warm water and the lungs become consequently filled with hot vapours. In expiration, the mouth still being fixed to the tube, the breath is forced up through the valve in the cover. In this manner the whole act of respiration is performed through this inhaler. As regards the application of the remedy, the patient, a little before bed time, is to take a dose of elixir paragoricum, and on going to bed he is to have the inhaler 3 parts filled with nearly boiling water and wrapped in a napkin but without obstructing the valve the apparatus being then placed at the armpit of the patient. The bed clothes being well drawn up to the chin, the victim inspires and expires for 20 minutes or ½ an hour. The inventor remarks that after the inhaler has been used a few minutes "the warm vapours under the clothes, by settling on the trunk will produce a sweat which will gradually extend itself to the legs and feet." A sweat being in Dr. Mudge's opinion "the most eligible evacuation for removing the fevers." The remedy will probably prove effective after a few days' application night and morning, but if (as the good Mudge expresses it) "the cough should at the same time that is

prevalent and fatiguing to the breast, continue dry, husky and without expectoration," then certain other drugs are necessary, and a prescription kindly supplied to him by Sir John Pringle is recommended. The flexible inhaling tube of our specimen is composed of leather and coiled wire, the mouth piece is ivory.

Unhappily one can no longer state that "The price of antique pewter is quite low." Prices have about tripled during the last 15 years. Specimens also are becoming much scarcer. However, these increases in price and scarcity are conditions common to all antiques, the net result to the inveterate collector being that while the number of specimens acquired decreases, the total expenditure on his hobby remains the same, an amount calculated to keep one slightly insolvent.

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THE WILLIAM OSLER MEDAL ESSAY

A STUDY OF IBN NAFIS

(Continued)

E. EDWARD BITTAR

PART III: A STUDY OF IBN NAFIS' COMMENTARY ON THE ANATOMY OF THE CANON OF AVICENNA

It is unfortunate that no chronological order can be given to the works of Ibn Nafis and the scholar is compelled to rely on guesswork. It is generally believed that his commentary on the Anatomy of Avicenna's Canon, which is one of his main works, was in all probability written after 1245 A. D. We are inclined to share this view, because Usaybia did not make any reference to this work.

As is well known, Galen, the exponent of Greek medical thought, believed in the existence of invisible pores in the interventricular septum through which the blood from the right ventricle seeped into the left. The Arab medical school, which adopted Greek precepts, accepted and followed Galen's teachings *in toto*. Rhazi and Al-Majusi, who wrote on the functions of the heart and lungs, strictly adhered to the theory of Galen and no one ever thought of questioning the soundness of his assertions. Even the great Avicenna, in his monumental Canon, followed faithfully the path trodden by his predecessors, and to him Galen presented truth that could not be challenged.

To Ibn Nafis, however, Galen's teachings were far from perfect and acceptable to his independent and shrewd mind, which always relied on "sensible investigation and common sense." To him Galen's concept of invisible septal pores was indeed a challenging paradox. The more he studied Galen and Avicenna, who was the mouthpiece of Greek thought in Arabic medicine, the more he became convinced of the errors of the two, and his opposition to Galen took a sharper turn. His investigations on gross anatomy, combined with inductive thinking, led him to the necessary conclusion that the septum was impermeable and that the blood from the right ventricle reached the left only via the lungs.

Knowing himself to be in the right on more than one point, his opposition to Galen took on a peculiar force, and thus his Commentary may be regarded as anti-Galenic. The difference, however, between Galen

and himself, is not a difference between two physicians, but a difference between two bodies of anatomico-physiological data and their interpretation. Ibn Nafis was not afraid to stand up against the orthodox teachings of his time and oppose and correct Galen; nor was he afraid to deal with the theological implications of his new teaching, concerning the concept of the "animal spirit." [49a]

There are two distinct reasons for studying Ibn Nafis' Commentary. The first is to fulfill the need for having a complete rendering into English of the sections from this commentary concerning the heart and lungs. The second, to fulfill the need for comparing such rendering with the versions of Tatawi, Meyerhof, Khairallah, and Haddad. Unfortunately there is only one complete rendering now available—this is Meyerhof's translation into German.

The following rendering is more or less literal. The manuscripts on which it is based are the ones Meyerhof used, namely, the Landberg-Persian manuscripts.[50] The Paris manuscript [51] was also studied and appears to agree in the main with the Landberg, as well as the copy owned by Haddad. Shehadeh, who made a detailed study of the Paris copy, arrived at a similar conclusion.[52]

THE DESCRIPTION OF THE CARDIOVASCULAR SYSTEM (A TRANSLATION)

In the name of the merciful and compassionate God, Ibn Nafis, the great master physician (God rest his soul and illuminate his grave) said: After thanking God and praying for his Prophets, it is now our object to comment as much as possible, on the anatomy of Avicenna, the Chief—Allah have mercy on him—contained in his Canon. For we have gathered what he had said in the first book of the Canon with the third book of these books, so that the commentaries on anatomy be wholly organized.

We have been prevented from carrying out dissection by our religious sense as well as the sense of mercy, and therefore, we have seen our way

[49a] *Ar-ruh al-haywani.* My reasons for rendering this term in the following translation by "animal spirit" (in contrast to Meyerhof's "vital spirit") have been elaborated in my thesis.

[50] Meyerhof, M. *Quellen und Studien.* The script in Arabic is appended to the article. I am indebted to Professor Schumacher at Freiburg University for a copy of Tatawi's dissertation including other relevant literature. Also to Professor W. Artelt at Frankfurt for excellent microfilms of the Tatawi and Meyerhof work.

[51] I am indebted to Dr. John Fulton for an excellent microfilm from the Paris library.

[52] Shehadeh, A. *Voice of Syria.* August 1954.

to rely on the teaching of our predecessors, who dissected in order to verify the morphology of the internal organs, especially Galen's, whose books are the best of those to have reached us on this art [anatomy]. For Galen had done research on many a problem, which had not been observed previously. Therefore, we mainly relied for our knowledge of the morphology and the description of the organs, etc., on Galen's teaching, except for small things, which were thought to have been mistakes in transcription or Galen having recorded them without careful investigation.

But for the functions of every organ, we rely on our knowledge based on observation, sensible investigation, and common sense, and we do this regardless of whether or not this [knowledge] is in agreement with the teachings of our predecessors.

It is fitting, before our discussion of anatomy, to write an introduction to help in the acquisition of the precise knowledge of this art [anatomy]. This introduction will contain five sections:

(1) The differentiation of animals with respect to their organs.
(2) The utility of anatomy.
(3) The functions of the various organs.
(4) Principles applicable to the acquisition of the knowledge of the functions through dissection.
(5) The subject matter of anatomy and the instruments used therefor.

The dissection of bones, joints, etc., will be found easy when performed on the cadaver, no matter what the cause of death. Still easier will it be if, after a period of time, the flesh has resolved with the ligamentous articulations of the bones becoming apparent. This would not require much work to obtain the knowledge of the shapes of the bones and joints.

The anatomy of the heart, arteries, pleurae, lungs, etc., however, depends on the manner these organs function, and whether the movement of the arteries is synchronous with the movement of the heart or asynchronous; likewise, the movement of the lung with the movement of the pleura. It is certain that the knowledge of this can only be obtained by dissecting the living, but this would be hard because of the painful response of the living to cutting.

But the anatomy of the small vessels, which are in the cutis and subcutis, will be hard to establish in the living for the reasons cited. Similarly, in the dead, those who have died of a disease or the like, especially those diseases causing an anemia and humidities [edema]. Such vessels get concealed, as in cholera, tuberculosis, and haemorrhage. The most

expedient dissection of these would be on the dead by asphyxiation, since strangling displaces the spirit or blood into the peripheral [vascular bed], in consequence of which these vessels become plethoric and dilated. This should be performed right after death because, if there is any delay, clotting occurs within the vessels, accompanied by decrease in the volume of the blood, and this entails diminution in the engorgement of these vessels.

Galen said: "It is my habit to asphyxiate under water what I want to dissect, to avoid bruising or tearing of any part of the neck, which might occur, if this is done with a rope or the like."

The Description of the Arteria—Venalis (Pulmonary Vein)

Part I. In a special description of this artery, Avicenna had said: "What stems first from the left cavity" . . . until he said "becomes thick and firm as it extends."

Commentary: This vessel resembles the veins as well as the arteries. It resembles the veins, because it consists of a single layer, and its calibre is thin; and according to their [Avicenna's] description, the blood filtrates through it to feed an organ.

It resembles the arteries, because it pulsates and takes root, as they say, from the heart and through it the inhaled air passes. Since pulsation of vessels is one of the properties of arteries, this vessel will be classified under arteries. Accordingly, it is termed arteria-venalis and not vena-arterialis.

We state that the vessels stemming from the lungs are different from all the vessels of the body, because in all organs the pulsating vessel has two layers, while the non-pulsating a single layer; the pulsating vessel is thick and the non-pulsating, thin. The pulmonary vessels are the opposite of this. Opinion in this matter differed, Asclepiades having remarked that this was due to the rapid motion and numerous movements of the pulmonary arteries. These [vessels] get thinned, because of constriction and dilatation, constriction and dilatation being a response to inspiration and expiration of the lung, and excessive movements weaken them. As to the pulmonary veins, they move in response to the movement of the lungs only. Their moderate movement fattens and thickens the bodywall. In the rest of the organs, the arteries move automatically. Their movement is moderate, and so they got tough and thicker. The veins are always motionless and this weakens the organs.

Galen corrupted this [view] in two ways: first, had it been as he says,

the difference would have consisted of the increase and decrease in thickness and not in the number of layers. Secondly, had it been so, the vessels prior to this movement, would have been equal in the lungs and elsewhere. For example, in the embryo, whilst the lungs have not yet moved, the pulmonary vessels still differ from the vessels of all the other organs. According to Galen, the reason why the pulmonary arteries are like this is their need to draw in air to the heart and to expel the residue. They must needs, then, readily respond in accordance with inspiration and expiration of the lung. Not so with the veins, for their function is to distribute the nourishment, and movement in them would be deleterious. Consequently, it is essential they be removed from responding by motion to the lungs.

What we say (and God knows better) is that whereas one of the functions of the heart is the generation of the spirit, which consists of highly rarefied blood, extremely mixable with an airy substance, it is essential that such highly rarefied blood and air meet in the heart to facilitate the evolution of the spirit from the compound formed of their mixture. This meeting takes place in the left cavity of the two cavities of the heart, where the animal spirit is generated.

It is also essential that there be in the heart of man, and other animals possessing lungs, another cavity in which the blood is rarefied to be fit for mixing with air. For if air were mixed with blood when thick, a homogeneous compound could not result. This cavity is the right cavity of the two cavities of the heart.

After the blood has been rarefied in this cavity, it must of necessity pass to the left cavity, where the animal spirit is generated. But there is no opening, as some thought there was between these two cavities, for the septum of the heart there is watertight, without any apparent fenestrations in it. Nor, as held by Galen, would an invisible opening be suitable for the passage of this blood, for the pores of the heart there are not patent and its septum is thick. The blood, therefore, after thinning, passes via the vena-arterialis to the lung for circulation and mixing with air in the pulmonary parenchyma. The aerated blood gets refined and passes through the arteria-venalis to reach the left cavity of the two cavities of the heart, after having mixed with the air and become suitable for the evolution of the animal spirit.

The residuum of less rarefied blood is used up by the lungs for its nourishment. Accordingly, the vena-arterialis was made strongly impermeable with two layers, so that what seeps through its interstices be

then highly rarefied, while the arteria-venalis was made thin. with a single layer, to facilitate the absorption of whatsoever filtrates into this vein. For this reason obvious openings between the two vessels were established.

Avicenna's statement: "The communication of the blood from the heart to the lungs, which nourishes the lungs."

This is the accepted view, but to us [Ibn Nafis] it is incorrect. The nourishment of the lung does not reach it via this artery, because this [vessel] does not rise superiorly from the left cavity of the two cavities of the heart. This is so, since the blood in this cavity comes to it from the lung rather than the lung taking it from it. But the passage of the blood from the heart to the lung is through the vena-arterialis, which [vessel] Avicenna mentions later on.

Avicenna's statement: "With a view to facilitating the filtration of rarefied blood into the lungs." This too is an accepted view, but the truth is contrariwise. For the vessel is so in order to facilitate the entry of the aerated blood passing from the lung to the heart.

The Aorta

Avicenna, the master said: "The other artery . . . below the heart."

Commentary: Whereas the blood and air passing in the arteria-venalis must be small in quantity according to the accepted view, because this blood's passage in the vena-arterialis nourishes the lung which is an organ in itself, the correct view is that the blood and air passing to the left cavity of the heart must be little. For had it not been so, the spirit in the left cavity would be throttled with the resolution of the indigenous heat. Consequently, this artery must be extremely small compared with the other artery called the aorta through which the spirit circulates to all the organs of the body. Associated with this spirit, as we have already shown in our Commentary on Book I, there should be rarefied blood, and this necessitates that the aorta be vast, and also because all other parts, except the left cavity of the heart, need the circulation of the spirit in them.

Avicenna's statement: "The vena-arterialis was made of two membranes similar to the other arteries."

He means two layers and it evolves in this manner in order that its body wall may be thin, with fine interstices to make it impossible for any except highly rarefied blood to filter through. What filtrates meets with much air distributed in the pores of the lung with which it mixes and becomes appropriate to generate the spirit in the heart, while the rest of

the blood, which does not filter through these interstices, passes out of the orifices of parts of this vessel for the nourishment of the lung. So the nourishment of the lungs consists of the residuum [of blood] in the portions of this vessel after the filtration of the thinned blood into the spaces of the lung.

The Anatomy of the Lung

Avicenna said: "As to the lung . . . it is intimately linked and attached to it."

Commentary: The lung needs the vena-arterialis to convey to it the blood which has been rarefied and heated in the heart, in order that the blood seeping through the interstices in the branches of this vessel into the spaces of the lung may mix with the air in these spaces. On mixing, the resulting composite is suitable to be the spirit, when it reaches the left cavity of the heart via the arteria-venalis. But what remains in the lumina of the branches of the vena-arterialis passes through the orifices into the pulmonary parenchyma. Such blood would be thicker and more watery than the blood, which filters, and serviceable for the nourishment of the lung. This vena-arterialis, whilst conveying to the lungs their nourishment, carries also the highly attenuated blood for mixing with the air for the perpetuation (continuation) of the animal spirit.

The need of the lungs, however, for the arteria-venalis, is the passage of this air, already mixed with blood, to the left cavity of the two cavities of the heart, where this mixture becomes the spirit. Also for the passage of the residual mixture in this cavity, which was unfit for the generation of the spirit, associated with the residue of air that was heated and rendered useless in the regulation of the spirit and [work] of the heart; this expelled of necessity to make room for the incoming air. This [residual air] reaches the lungs either alone or mixed with the parts of the attenuated blood for expulsion in expiration.

The lungs, then, need to be of porous, loose tissue, accommodating a multiplicity of wide spaces, the purpose of which is their filling with air, and within which the air is tempered by the attentuated airy blood, which is unfit for the nourishment of the lungs. However, [this blood] is fit for mixing with the air, the combination of which produces a substance appropriate for the generation of the spirit in the heart.

Avicenna said: "The arteria-venalis, as well as the vena-arterialis, participate in the nourishment of the lungs with whole pure blood."

As we have outlined before, it is correct that the function of the vena-

arterialis is to convey the nourishment from the heart to the lungs. This represents the blood left as the residue in this artery after filtration of the attenuated parts of the blood which, when mixed with air, results in a compound suitable to become the spirit. But the view that the function of the arteria-venalis is to transport nourishment from the heart to the lungs has been shown to be unfounded, since the function of this vessel is to transport the air already mixed with the rarefied blood from the lungs to the left cavity of the heart. There is nothing in this cavity suitable for the nourishment of the lungs. This has been pointed out earlier.

Avicenna said: "The heart is a creature . . . since its movements are involuntary."

Commentary: As we have pointed out already, the function of the heart is to generate the animal spirit and distribute it to the organs for their living. The generation of this spirit is the result of the heating of the blood and its rarefaction, the mixing of which with what there is of air in the lungs makes the ultimate composite, suitable to become an animal spirit as soon as it reaches the heart.

It is necessary, therefore, that there should be a cavity to hold the blood, which is needed for heating. What would occur in it is the boiling of the blood, essential for its dissociation and expansion. It is not enough that such blood be contained in the vessels, since they cannot accommodate the expansion which is needed for the thinning of the blood's constituents. Hence, it is essential to have another cavity to contain the animal spirit from which this spirit circulates via the arteries to all the organs.

This spirit is, of necessity, highly rarefied and aery. As it inevitably is subject to rapid decomposition, the heart continuously provides it with nutrition, and its nutriments must be of its own essence. Accordingly, the spirit must be of a predominantly airy essence to facilitate mixing with the highly rarefied parts of the blood. The composite of this mixture and its cooking is to prepare it to become the spirit in the heart. This cooking and combining cannot occur initially in the heart, for we shall show that the heart is always in diastole and systole. This does not allow the retention of the composite [substance] for mixing and cooking. So the beginning of this cooking and mixing must occur in another organ in order that if the substance approaches the state of becoming a spirit, it will pass to the cavity of the heart which is full of the spirit. In this cavity the (substance) takes on the character of the spirit and affords the (spirit) sustenance.

The organ affording the readiness for such a process must contain a

large quantity of air in order to mix with the blood rarefied by the heart. Of this combination a substance is formed fit for the nourishment of the spirit. Such an organ must be close to the heart, for, if distant, the rarefied blood passing to it from the heart would then be cooled and thickened in the course of the long distance. For this reason, its rarefaction would be impaired. Moreover, the air leaving the organ combined with the parts of the blood which were prepared for the nourishment of the spirit, on reaching the heart will have cooled and been rendered unsuitable. Such an organ therefore, in which this substance is prepared for the nourishment of the spirit, and with abundant air in it, is also situated close to the heart. This organ is the lung.

For the nourishment of this spirit in the heart, it is essential for the blood within the heart to be rarefied, and its consistency attenuated. Subsequently, the blood passes to the lungs, mixes with whatever air is in them, and gets " cooked " until it is converted and made suitable for the subsistence of the spirit. Then, it passes on to the spirit in the heart, mixes, and sustains this spirit.

This place, which is in the heart wherein the spirit abides, must of necessity be large enough to supply the whole body with this spirit. Hence, the heart consists of one cavity to contain the blood and within which the blood is rarefied, and another cavity to contain the spirit from which it circulates to all the organs.

Also, of necessity, the cavity containing the blood should be close to the liver in which [organ] the blood is formed, and this is on the right side of the heart, for the position of the liver is on the right side of the body.

Of necessity, the position of the cavity containing the spirit should be on the left side of the heart and this left cavity should be larger than the right cavity, because the blood, which mixes and combines with the air, is so small in amount and the spirit such an airy essence. The blood then required for thinning in the heart need not be very much, but the spirit in the left cavity should be abundant for distribution to all the organs. This is the reason why the cavity need be spacious and deep; and that is why the heart need be longish, to make room for depth to this cavity.

In this heart there should be ample place to accommodate two cavities. Such accommodation should be superiorly at the base of the heart, so that each cavity be proximal to the lung and could be reached rapidly by the blood, which has been rarefied in the right cavity, while the blood

prepared in the lungs for the nutrition of the spirit moves rapidly into the left cavity of the heart. This is the reason why the most spacious region in the heart should be at its base, while its narrowest at the apex of the heart, where the cavities end, inasmuch also as such spaciousness would be superfluous and only occupy the place necessary for other organs close by. The change in shape, therefore, from thickness and spaciousness at the base to narrowness at the apex, should be gradual in the manner of the gradation of the left cavity, from its width superiorly to its narrowness inferiorly. This is why the shape of the heart is conical.

Avicenna's Statement: "There are in it three ventricles."

This statement is not right, since there are in the heart two ventricles only, one of them full of blood, and this is the right one, while the other full of spirit is the left. Moreover, there is absolutely no opening between these two ventricles or else the blood would pass into the region of the spirit and destroy its essence.

Anatomy defies what they [Avicenna] say, for the septum between the two ventricles is much thicker than any other, preventing the passage of any of the blood and spirit and thus their loss. Also, the statement that the septum is porous is wrong. What made him [Avicenna] accept this view was his belief that the blood in the left ventricle reaches it from the right ventricle through these pores. This belief is fallacious, since the passage of blood to the left ventricle is from the lung, after heating and its outflow from the right ventricle, as we have already established.

Avicenna's Statement: "In order that there may be a store of nutrition for its feeding, thick and tough resembling its essence and a substance of spirit generated in it from thinned blood and a passage in between them."

Commentary: His object was to demonstrate the proof of three ventricles, which he envisioned, but there are two ventricles only, as we have already shown. His concept also that the blood in the right ventricle feeds the heart is absolutely wrong, for the supply of the heart is from the blood circulating in the vessels, which are distributed in the body of the heart. If the heart fed from such blood in the right ventricle, it would then be disposed to resemble its essence, inasmuch as it would be also thickened and viscous. But the blood is not so. It is thinner than any other blood in the organs, as the object of this blood is to get rarefied and its consistency attenuated in the right ventricle, and then go up into the lung to mix with the air in it and then to pass via the arteria-venalis into the

left cavity of the two cavities of the heart. From this composite [a compound of air and thin blood] the animal spirit evolves.

Avicenna's Statement: "And this passage dilates on the widening of the heart and contracts on its lengthening."

That which Avicenna claims to exist and calls an intermediate ventricle has been shown to have no existence, apart from its property of differing in dilatation and contraction, which he attributes to the widening and lengthening of the heart. For the only movement of the heart which we know is the movement of diastole and systole. As to lengthening and widening, we believe these to have no existence.

Avicenna's Statement: "The base of the left ventricle is higher, while the base of the right ventricle much lower."

The reason for this is that the apex of the heart, which is its incisura, tilts to the left side, as we have shown. It follows, therefore, that its base should assume this description.

Avicenna's Statement: "In diastole the blood is drawn into its interior, as well as the air."

It is common opinion that the right ventricle of the heart has also a movement of diastole and systole. In diastole the blood is drawn in, inasmuch as the left ventricle draws in the aerated blood in diastole. This to us is utter nonsense, since the inflow in diastole and systole would represent rarefied substances and not blood. Any substance is drawn in by virtue of the vacuum rendered in diastole, provided there is no thinner substance to be drawn in. For the vacuum draws in the thinned, then the thicker, if the thinner is exhausted. And the blood is drawn into the heart by force of its physical attraction, as in some of the other organs. The diastole and systole of the left ventricle, as will be shown elsewhere, are for the regulation of the spirit by the air, the expulsion of the residuum and the sustenance of the spirit through what it absorbs of the air, mixed with the rarefied blood. All this does not happen in the right ventricle. For this reason, the right ventricle—God is the All-knowing—is absolutely motionless.

Avicenna's Statement: "Wrong is he who thinks the heart is muscular, though it is the most closely homologous to it, but its motion is involuntary."

Commentary: We have shown in many places that the motion of the heart in diastole and systole is a voluntary motion, although we are not conscious of it, nor do we will it in a manner analogous to [voluntary]

muscle. Whether or not the heart is to be called muscular, such a question as this does not warrant dispute.

While Ibn Nafis regarded the aorta as the great vessel through which the "animal spirit circulated to all the organs of the body," the view is held here that he had no vision at all of the greater circulation. He seems to have accepted the Galenic conception of the supply of nutrition to the body tissues in an ebb and flow manner via the venous channels. He was Galenic in this sense because he plainly lacked the knowledge of how "the blood forced by the action of the left ventricle into the arteries . . . passed through the veins and along the vena cava and so around to the left ventricle . . . which motion we may be allowed to call circular" (Harvey, 1628). Yet, even so, they had one thing in common; this is the unitarianism pervading their scientific thought. Ibn Nafis joins Harvey in the belief that: "The heart is the beginning of life; the sun of the microcosm . . . it is the household divinity which, discharging its function, nourishes, cherishes, quickens the whole body and is indeed the foundation of life, the source of all action. . . ." [53]

True, Ibn Nafis made errors at the same time he was setting forth a great scientific truth, but his views should be judged only by the standards of his time. This particular study of his description of the cardiovascular system is by no means complete. The whole of his anatomical writings would have to be studied intelligently before any proper or final reappraisal can be made.

Ibn Nafis' writings no doubt show the full extent of the insight and power of his mind as author, compiler, and commentator. His style in Arabic is peculiarly his own and it tells of his personality in every line. It is clear, lucid, and follows logical sequence, which is characteristic of a scientific mind. In his Commentary on the Anatomy, one will see him repeating and emphasizing the points on which he places great importance as a teacher lecturing to his students, accentuating those which he aims to impress upon their minds, especially his anti-Galenism which culminated in his description of the lesser circulation.

Ibn Nafis' life was entirely devoted to medicine, to teaching, and writing, and like his master Ad-Dakhwar he gave up all personal happiness that a home and family can give and remained a bachelor, wrapped up in

[53] Mason, S. *A history of the sciences*, p. 174.

his profession of serving—day and night—all who needed his help. Like Dakhwar, he bequeathed his luxurious house and library to the medical school and hospital at which he taught the greatest part of his life. He continued working and writing almost up to his death, endeavouring to complete his " All-Embracing." Close upon his eightieth year, however, he suddenly fell ill and took to bed. It is recorded that his fellow physicians asked him to take wine as a remedy, but, as a good Mohammedan, he refused to, saying " I would not face my Creator with wine in my body." He knew of impending death, and gradually his health declined till on the sixth day of his illness, Friday, December 18, 1288 A. D. he quietly passed away.

Ad-Dahabi [54] records the last days of Ibn Nafis' life as well as his death, and Safadi recalls the eulogy, which he heard the Christian Al-Safadi Ibn Mauhub recite, while Asnawi, the great biographer of the Lives of Shafi'ites, saw in his death the passing of " the leading authority in medicine and the marvel of his Era, in both the East and the West." [55]

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[54] Dahabi, S. Al-Ibar fi Akhbar man Ghabar, ms. in Ahmadieh Waqf Library, Aleppo.
[55] Asnawi, J. Tabaqat Al Shafi'ieh. Ms. No. 56 (History No. 176) in the Zahiriya National Library, Damascus. Also: Hanbali, A. *Shazarat Al-Zahab* (The Golden garnerings in the history of those who are passed) V, p. 401.

under the title of " Ibn al-Nafis and his Theologus Autodidactus " in the *Journal of the French Archaeological Institute* in Cairo.

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Wer nicht von dreitausend Jahren
Sich weiss Rechenschaft zu geben
Bleibt im Dunkeln unerfahren,
Mag von Tag zu Tage leben.

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* Compiled by the Committee on the Bibliography of the History of Medicine of the United States and Canada which was composed of the following members: Milton B. Asbell, the late James M. Ballard, Whitfield J. Bell, Jr., Philip M. Benjamin, W. W. Francis, Glenn Sonnedecker, Lloyd G. Stevenson, and Genevieve Miller, *Chairman*. Preliminary galleys sent to librarian members of the Association and others interested in the project brought additional references and communications from Alex Berman, George J. D'Angelo, Janet Doe, Wesley Draper, Alice J. Driscoll, Minna Lane, W. B. McDaniel, 2d, Samuel X. Radbill, Elizabeth E. Schramm, Anna M. Sexton. Members are urged to send reprints of all papers on American medical history to the Chairman.

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NOTES AND COMMENTS

RECOLLECTIONS CONCERNING EARLY ELECTRO-CARDIOGRAPHY IN THE UNITED STATES

ALFRED E. COHN, WITH A LETTER OF HORATIO B. WILLIAMS

In connection with an exhibit of the Smithsonian Institution in Washington (see this *Bulletin*, 1954, vol. 28, p. 575), Dr. Alfred E. Cohn sent us a note prepared December 4, 1946, which illness had prevented him from submitting for publication earlier. Dr. Cohn also included a letter from Dr. Horatio B. Williams to whom he had sent the note at the time. We wish to thank Dr. Williams for permission to publish his letter in the *Bulletin* together with Dr. Cohn's communication.

—Ed.

It often happens that pieces of important information about more or less significant things and people get lost. Sometimes a good deal of history goes along with them. One such piece was awakened by learning of the death of Mr. Charles F. Hindle on November 23, 1946, recorded in *The New York Times*. The newspaper paragraph referred to Mr. Hindle as an " inventor of an electrocardiograph which has been in use for the last thirty years for the recording of heart beats."

The facts are these: At The Rockefeller Institute for Medical Research the first string galvanometers to make electrocardiograms which we had were manufactured by Edelmann in Munich. Curves on patients began to be recorded on March 5, 1911. To carry on accurate research these were unsatisfactory instruments because of their lack of rigidity. At this juncture I appealed for help to Horatio B. Williams. He was at that time Professor of Physiology at the College of Physicians and Surgeons at Columbia University. Williams had also been working, together with Dr. Walter B. James, with an Edelmann galvanometer. Dr. James at the Presbyterian Hospital and I, at the Mount Sinai Hospital, imported the first two of these instruments, mine actually first. James and Williams published the first clinical paper [1] in this country using this apparatus. Williams was accordingly already familiar with the problems connected with the use of such instruments. I turned, as I have said, to Dr. Williams for suggestions on matters of construction. Williams's first intention was to reproduce for us exactly the instrument which Professor W.

[1] James, W. B., and Williams, H. B. The electrocardiogram in clinical medicine. *Am. J. Med. Sci.*, 1910. *140*. 408.

Einthoven had built for himself in Leyden, Holland. The specifications for that had been published. It was for the invention of his galvanometer and for the first researches with its use that Professor Einthoven received the Nobel Prize in 1924. It adds a touch to recall that the news of his winning this prize came to him while he was delivering lectures in this country.

We ordered a duplicate of the Leyden model. In the midst of war (1914) the manufacturer in Germany could not find, however, the Swedish iron necessary for the cores of a new galvanometer. At this point Williams concluded that he would like to try his hand at a new design. He knew Charles Hindle and believed that he could be entrusted to experiment in its construction.

Mr. Hindle was himself born in England. Now, in America, he undertook this commission and built for me, for use at The Rockefeller Institute, a galvanometer so satisfactory that after 32 years it was still in use. It was in 1914 when we made the first electrocardiogram with the new instrument. With this one, two other galvanometers, subsequently constructed by Mr. Hindle, were associated. This made it possible for many years, as a uniform practice, to inscribe simultaneously the three conventional limb leads of an electrocardiogram. Much experience is available, therefore, to compare the relative values of the first experimental and the later commercial machines. There can be no doubt that the later ones, built in accordance with the same general, original design (1914) although they leave nothing of importance to be desired, are not quite as admirable as the first experimental instrument.

A word about the design. Dr. Williams's plan for the pole shoes was exactly the same as Professor Einthoven's. The two instruments differ principally in the shape of the magnet, as those familiar with this piece of apparatus know. The original Einthoven magnet is not circular as is Dr. Williams's but consists instead of two parallel cores, wound, of course, with copper wire and set in a metal plate at one end. The pole shoes are fastened to the cores at the other end. Between the shoes a gap is left in which to hang the string of the galvanometer. There were naturally other less important modifications of Professor Einthoven's apparatus.

The result, completely satisfactory, is evidence of Mr. Hindle's careful and exact craftsmanship. At the same time, also, this is a tribute to Dr. Williams's knowledge and engineering competence. This first galvanometer of ours, if it is not the grandfather of this kind of galvanometry, that honor is Einthoven's, has certainly been the father of all subsequent

galvanometers manufactured in this country. The part which Dr. Williams and Mr. Hindle played in this development is too little known. They have made a whole race of specialists in cardiac diseases, and indeed of physiologists, their debtors.

ALFRED E. COHN, M. D.

January 7, 1947

Dr. Alfred E. Cohn
The Rockefeller Institute for Medical Research
66 Street and York Avenue
New York 21, N. Y.

Dear Alfred:

Many thanks for your nice letter of 12 December and the MS. Trips to Chicago and Washington have delayed my answering more promptly.

There seems to be a genuine interest in the beginnings of Electrocardiography in the United States and from time to time I have been asked about this early history. Upon such occasions I have been tempted to publish my own knowledge of the matter. So it occurs to me that your proposed article is very opportune, and I am suggesting that perhaps you would like to consider making the paper somewhat more complete so as to constitute a permanent record. I think it would be interesting reading to many present users of Electrocardiographs.

Your recollection of events coincides in most respects with mine but I am adding a few details as suggested in the foregoing paragraph.

If you desire any clarification of what I have written I should be only too glad to do so. Or if you care to include a photograph or two of early galvanometers made in this country, I think I could get such photographs for you. As you have noted, the reference to Mr. Chas. Hindle as "the inventor of the Electrocardiograph" is rather unfortunate since, of course, his contribution was almost entirely that of a skilled mechanic. Any number of men qualified such as he, were available to execute the designs furnished to him. Accordingly I agree with you that the record should leave no doubts on the score that Einthoven was the inventor of the Electrocardiograph.

In 1911 Professor Einthoven loaned me the drawings from which his magnet was made. I gave the job of making our magnet to Hartmann and Braun of Frankfurt a/M. because they had made the several powerful magnets designed by Professor H. DuBois and I knew they understood

how to do the work. The magnet as they made it was imported duty free for 1500 marks which at that time was equivalent to about $250.

The microscope parts were obtained from Zeiss and were better than those used by Einthoven due to advancement of the optical art. Certain parts, for example the double slides used for centering the microscopes, were not available commercially and I made these with my own hands in the Columbia Laboratory. John Hoyt, the Department mechanician, made the galvanometer cover and assisted in the general setting up. This Electrocardiograph, the first manufactured in this country, performed essentially the same as the Leyden instrument. Your own dissatisfaction with the Edelmann Galvanometer was not diminished when I demonstrated for you the incomparable superiority of Einthoven's design and soon after, you came to see me about getting a duplicate.

Chas. Hindle had then been working as mechanic for John B. Flowers, a young electrical engineer who was prosecuting a research in my laboratory on voice operated typewriters. Hindle had constructed instruments for Flowers under my supervision and had built, out of hours, a photographic recorder of my design for Presbyterian Hospital, used by Dr. T. Stuart Hart. I was quite certain that under my direction he could put together for you the equivalent of my instrument if you obtained the magnet and the optical parts from Germany, although at that time he knew nothing about the design or construction of electrical instruments except what I had taught him. He was a careful, well-trained machinist and had come to this country as a boy. He had had no previous connection whatever with Cambridge Instrument Company, Ltd.

On my advice you ordered the parts and received the Zeiss optical parts in July 1914. Early in August you brought me a letter you had received from Hartmann and Braun regretting that the Russian blockade had cut off their supply of Swedish iron. You may recall that the German Company offered to complete the job if you were willing to " wait a few months until we had won the war." You then asked me whether it would be possible to make the magnet in this country and I gave you my opinion that it would and also mentioned that it would be very expensive since the original design was not based on considerations of manufacturing economy but upon what forgings could be obtained in Leyden and what size pieces could be handled with machinery available in Leyden. After estimating the cost of making the magnet of Swedish iron in this country at $3,000. which seemed a pretty heavy outlay in comparison with the $250. cost of the original one, I considered what could be done to produce the equivalent at less cost here in our country.

Einthoven's instrument had been completed prior to 1903 and by 1912 we were making castings of soft steel of high permeability. Following somewhat the design of DuBois' second (half-ring) magnet and using Swedish iron for pole shoes I computed a magnetic circuit which would equal that of the original Einthoven instrument with less magnetic leakage. The galvanometer was built under my close supervision and the last stages of its completion were made in my laboratory, after which I made complete determination of all of the physical constants. The steps necessary to overcome the imperfections of this galvanometer, as originally built, is an interesting story in itself.

The beautiful individual wedge-shaped brass spooled field coils were copied from DuBois. His arrangement made it possible to combine the coils in a variety of ways, but of course this was unnecessary in using the magnet for a string galvanometer. The entire magnet cost about $900. to make and the spools and their winding accounted for $300. of this. The next galvanometer built had taped pancake coils which were equally effective and greatly reduced the cost. The method of making the quartz galvanometer strings conductive by plating them in vacuo, was worked out and communicated by me to the American Physical Society in 1913, and published in the Physical Review in 1914.

As the war progressed it became impossible to obtain accessory equipment so I taught Mr. Hindle to make and adjust resistances, build optic benches, etc. The statement that he "invented the Electrocardiograph" or even that he designed the instruments he built is of course, an exaggeration. Many people know the actual facts and in consideration of correcness of the record, such a statement could not be justified.

At the end of World War I, perhaps a dozen instruments had been produced and the matter of continuity of service for the instruments installed and further technical development of the Electrocardiograph itself, became serious problems. It was evident to me that the full time services of electrical and mechanical engineers would be required as the magnitude of the undertaking had outgrown the attention which could be given it incidental to my work at the University.

A happy solution was reached in 1922 when the business was incorporated as the Cambridge Instrument Company, Inc. This brought the services of experienced instrument engineers to bear on the problem together with adequate manufacturing facilities. In my opinion it is this combination which has been largely responsible for providing American physicians and hospitals with the excellent equipment to which your last paragraph refers.

You mention in Paragraph 4 of your MS " There can be no doubt that the later ones . . . are not quite as admirable as the first experimental instrument " is perhaps subject to misinterpretation. This large liberally designed galvanometer is, I agree, a very fine instrument indeed and the records it produces are still and will probably continue to be the standard of comparison. As a general laboratory instrument for physiological research work this design has possible advantages over the smaller galvanometers which I designed later and a great many of them are still in use. However, with technical advances in materials and skills it has been possible to steadily reduce the weight and size of all parts of the Electrocardiograph, so that my latest galvanometer—type " P "—is 1/25th the weight of the original. Despite this, it has a natural period of .01 second at electrocardiographic sensitivities, a figure which is equal to the best performance attainable with the larger galvanometer. For straight clinical Electrocardiography I prefer the later models because of their portability, simplicity of operation and freedom from necessity of skilled help to maintain.

In 1924 and 1926 I published, at the invitation of the late Professor F. K. Richtmyer, two papers on the Einthoven string galvanometer in the Journal of the Optical Society and Review of Scientific Instruments. The first was theoretical and the second dealt with experimental results. I do not know whether you ever received reprints of these, but if not I shall be glad to send you copies.

It was nice to hear from you. Last time I saw you you had recently been under an operation. I hope you are quite well now.

Sincerely yours,

HORATIO WILLIAMS

MEDICO-HISTORICAL NEWS AND ACTIVITIES

ANNOUNCEMENTS

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE
TWENTY-NINTH ANNUAL MEETING
DURHAM, N. C., APRIL 19-21, 1956

Headquarters Hotel: Washington Duke Hotel, Durham, N. C.

Committee on Papers and Lectures: GEORGE ROSEN, M. D., Ph. D., *Chairman.*

NATIONAL NEWS

American Academy of the History of Dentistry

The Academy will meet on October 14, 1955, at the Mark Hopkins Hotel, San Francisco. Apart from the presidential address in the morning and a business meeting in the afternoon, the following papers will be read: Allen R. McDowell, "History of Dentistry, Pacific Northwest and Pacific Southwest"; Vivian A. Prindle, "History of Dentistry in California and the West"; J. B. Saunders, "Early Medical and Dental Lore About the San Francisco Bay"; Arthur H. Merritt, "Thomas William Parsons, Dentist, Poet, Translator of Dante"; E. S. Khalifas, "Our Recorded and Unrecorded History"; and George B. Denton will discuss a Fauchard manuscript.

American Institute of the History of Pharmacy

The annual business meeting of the Institute was held on Wednesday morning, May 4, 1955, at Miami Beach, in conjunction with the convention of the American Pharmaceutical Association. In the afternoon the Institute sponsored a historical program on the theme of "History Hobbies for the Pharmacist." Officers elected were: Theodore Klumpp, president; Rufus A. Lyman, honorary president; P. H. Costello, first vice president; Hugo H. Schaefer, second vice president; Glenn Sonnedecker, secretary; and S. H. Dretzka, treasurer.

Dr. Glenn Sonnedecker, Secretary of the Institute at the University of Wisconsin, will spend a year abroad on historical research as a Fulbright Research Scholar and Fellow of the Guggenheim Memorial Foundation. During his absence, Dr. Alex Berman will serve the University as a visiting professor in the history of pharmacy and as Acting Secretary in the Institute with its Director, Dr. George Urdang.

Armed Forces Medical Library

According to the Library's *News* (July 1955), the 1950-1954 *Catalog*, the first cumulated edition of the Library's printed catalog, is now in process of publication. It will supersede the annual volumes of 1950-1953; in addition, it will contain the records of the 1954 cataloging activities, plus a portion of the cataloging completed (to the end of 1954) in the History of Medicine Division.

The first of a series of semi-permanent exhibits to be displayed in the new Exhibit Room of the Library portrays the life and work of John Shaw Billings, 1838-1913 (*News*, September 1955).

Beaumont Medical Club

The twentieth Beaumont Lecture on the Carmalt Foundation was presented by Lloyd G. Stevenson who spoke on "Religious Elements in the Background of the British Anti-vivisection Movement."

The following were elected officers for the coming year: Max Taffel, president; T. R. Forbes, vice president; L. L. Waters, Secretary-Treasurer.

The Schuman Medical Historical Essay Prize

Mr. and Mrs. Henry Schuman of New York offer annually a prize of $250.00 for an original essay written in English, *not to exceed 10,000 words*, on some subject pertaining to the history or philosophy of medicine.

To be eligible, an essay must be written by a doctor of medicine, or of one of the medical sciences, who has taken his or her M. B., or M. D., or Ph. D., degree not more than five years prior to submission of the paper. The competition is open to candidates of any country. Essays which have won awards in other contests are not eligible. The prize-winning essay will be published in the *Journal of the History of Medicine*. The judges reserve the right to withhold the prize in any year if no essay is deemed of sufficient merit.

Entries should be submitted on or before 1 May 1956 to Dr. John F. Fulton, Yale University School of Medicine, 333 Cedar Street, New Haven 11, Connecticut, U. S. A.

NEWS FROM ABROAD

International Congress of the History of Medicine

The fifteenth International Congress of the History of Medicine is scheduled for Madrid and Salamanca, the latter half of September, 1956.

International Congress of the History of Science

The eighth International Congress of the History of Science will take place September 3-10, 1956, in Florence, Italy, with a final session in Milan.

BOOK REVIEWS

A. C. Crombie. *Oxford's Contribution to the Origins of Modern Science.* Oxford: Basil Blackwell, 1954. 27 pp. 2s. 6d.

This little book is a reprint of a paper read before the British Association for the Advancement of Science, meeting at Oxford in September, 1954. It aims to give an historical sketch of scientific activities and personalities at Oxford during the two periods in which, according to the author, modern science took shape: the thirteenth and fourteenth centuries, and the seventeenth century. In the first period, Mr. Crombie states, "a brilliant group of Oxford men assisted in transforming the conception of science inherited from Aristotle into the beginnings of our modern conception of experimental and mathematical physics." In the second, Oxford served along with London as the meeting-place for those devotees of "Experimental Philosophy" who came to form the Royal Society. Both periods were characterized by a concern with scientific methodology, by *experimenta lucifera* (to use the Baconian term), and by essays in theory-building. And in both periods scientific investigation was encouraged by institutional support.

Considering its limited scope, Mr. Crombie's account is praiseworthy for the number of Oxonian scientists it passes in review, and for its reflection of primary sources. And the historical perspective which Mr. Crombie suggests has the merit of pointing to the interplay between tradition and novelty, between disciplined learning and free inquiry, between the active search for facts and the trained use of the imagination, upon which the advance of scientific knowledge depends.

Curtis Wilson

William J. Maloney. *George and John Armstrong of Castleton, Two Eighteenth-century Medical Pioneers.* Edinburgh and London: E. & S. Livingstone Ltd. (Baltimore: Williams & Wilkins Co.), 1954. xii + 116 pp. Ill. $4.00.

The late Dr. W. J. Maloney (1882-1952), onetime Professor of Nervous and Mental Diseases at Fordham University in New York and at the Postgraduate Hospital and Medical School, "spent the last few years of his life in indefatigable researches, both in Britain and in the United States, into the life and work of George Armstrong and of his elder brother John, the well-known poet-physician, friend of Smollett, and the loyal protector and financial backer of George in his efforts to ameliorate the health [or rather the sickness] of children in the poorer quarters of eighteenth-century London.

"John's history is fairly well recorded, but the account of George's life work . . . is the first authoritative biography to be written. It is based on information discovered in contemporary books, journals, and unpublished documents by the author, who, with rare pertinacity, explored for this purpose the chief repositories

of eighteenth-century archives, both public and private." On Dr. Maloney's death, he left seven chapters of his book complete, or nearly so; six others required revision; and two more had to be assembled from hints and odd notes by Mr. F. N. L. Poynter, Librarian of the Wellcome Historical Medical Library, who was the literary executor, and whose introductory note is quoted above.

George Armstrong (1719-1789) is remembered in the history of medicine because he established the first hospital for sick children (1769) and at the same time inaugurated the Dispensary movement; and because he gave the classic description (1771) of the post-mortem appearance in congenital pyloric stenosis, establishing also its familial character. He was a pioneer of social welfare for children and of preventive pediatrics. Through his Dispensary and his books he taught medical practitioners, and mothers, too, sound sense and the elements of a new science. His *Essay on the Diseases most Fatal to Infants* (first edition, 1767) contained enough good matter to piece out two reputations—his own and that of Michael Underwood, who borrowed from him liberally and meanly disparaged him. Despite all this, Sir George Still was forced to write (1931): "Strangely enough we know little about him: '*floruit* 1767' says the 'Dictionary of National Biography.' We know neither the date of his birth nor the date of his death. It is probably only through the accident of his being the brother of John Armstrong that we know anything at all about him, beyond what is to be found in his writings." Dr. E. Caulfield (1931) brought forward the first new knowledge from contemporary sources, but the heaviest clouds of obscurity have been dispelled by the devoted efforts of Dr. Maloney. A sad tale it is, for George Armstrong's conviction that free medical care should be provided for the children of the poor ruined him completely, beggared his family, and ended in apparent failure and defeat; yet between 1769 and 1780 the Dispensary for the Infant Poor treated some 35,000 patients.

This book is solidly based on thorough research. The twenty pages of notes in fine type are packed with information. The short volume is beautifully organized. It is well and plainly written. Dr. Maloney perhaps took the reader with him into the dust of the archives once or twice too often, but one reader, at least, has enjoyed the search—almost as much as the findings. John Armstrong's career, too, is more interesting than might be expected. I have read nothing else which makes so clear the difficulties of a Scottish practitioner trying to make a start in eighteenth-century London.

John Armstrong may come to be remembered because he was the brother and supporter of the great, the gloriously incautious, the madly philanthropic George. The elder brother's bibliography would seem to me a matter of antiquarian interest only; but an exact bibliography of the younger brother would be worth the trouble. What is most important, however, is palatably served for us here in little more than a hundred pages.

I once observed, in reviewing another book in the same series, that the medical biographies published by Messrs. Livingstone offered little fresh material. Zachary Cope's *Cheselden* and Maloney's *George and John Armstrong* prove the generalization much too hasty.

LLOYD G. STEVENSON

Ed. Frison. *L'Évolution de la Partie Optique du Miscroscope au Cours du Dix-neuvième Siècle.* Les Test Objects, les Test-, Probe- et Typen Platten. Communication No. 89 du Rijksmuseum voor de Geschiedenis der Naturwetenschappen à Leyde, 1954. 168 pp. Ill.

This survey of the evolution of the microscope in the 19th century is subdivided into chapters on the evolution of optic glass, of achromatic and apochromatic lenses and object systems, of oculars, immersion, conversion, lighting, objects covers, and eventually of test objects and platten, which played such a role in research on diatoms.

"The 19th century has been by definition the century of the renaissance of the microscope." This analysis of the technological aspects of this renaissance, and of the evolution of microscope construction from empiricism to science, is the only one in existence in monograph form. It is a fascinating story, told in a somewhat disconnected fashion ("quelque peu décousu" as the author says himself), but based on a profound knowledge of the subject, numerous unpublished sources, and numerous control experiments with the old instruments. It is admirably free from national bias, a particularly important feature in a subject spread over so many nations. The great role of amateurs in the development of the microscope is duly emphasized. A chronology, plates, and biographical notes on many (perhaps not enough) of the interesting men involved in this process, who range from painters' apprentices to physicists, add much to the value of the valuable little book, so rich in factual material.

In comparing this history of the microscope with the history of microscopy, the interesting fact emerges that accomplishment in one field is not necessarily paralleled by accomplishment in the other within one nation. The Germans were beyond any doubt the world's best microscopists around 1850 but it was the English who built the best microscopes at that time. Microscopists were not sufficiently appreciated in France in spite of French accomplishments in microscope construction. German supremacy in microscope construction came (through the application of science by Abbé to these production problems) long after the outstanding accomplishments of Johannes Mueller, Purkinje, and their pupils.

Erwin H. Ackerknecht

Iago Galdston. *The Meaning of Social Medicine.* Cambridge, Mass.: Published for The Commonwealth Fund by Harvard University Press, 1954. viii + 137 pp. $2.75.

The concept of social medicine and its meaning is the theme of this book. Social medicine has recently achieved prominence in the medical and public health fields. What is the meaning of this phenomenon? Is the current use of the term social medicine merely a fad? Does it express a completely new idea? Or does it reveal a need for restating older views that had been neglected with the passage of time, and for implementing this newer formulation through the medical and public

health knowledge of the present? This book endeavors to answer these questions, and to show what social medicine can accomplish, specifically in medical education, by its orientation toward the achievement of health rather than the cure of disease.

The tools employed toward this end are conceptual and historical analysis. Indeed, in his "Foreword," Galdston says: "For such merit or value as this work may have lies not primarily in its conclusions, but rather in the historical and ecological data upon which the conclusions are based. Indeed the originality of this work is to be found in the exposition of the argument rather than its conclusions. The latter, though not widely appreciated, have in a measure been anticipated by others."

With this emphasis on historical analysis one can only agree. Various strands have contributed and are continuing to add to the growing fabric that is social medicine. Without understanding its history, no idea can really be grasped and appreciated. Ideas do not appear full-blown, like Athene sprung from the brow of Zeus; they come into being in response to human needs and aims, and grow and develop, or decline with the varying fortunes and circumstances of men. An idea as we perceive it today may not be quite as new as it looks; it may be only refurbished and dressed in the fashion of our time. It may be compared to an iceberg. Most of it is submerged in the past, only a small part thrusts into the immediate present. By uncovering the submerged past of an idea, its present appearance can be seen in truer proportion.

In the light of these considerations, then, how and what does the book under review contribute to a better understanding of social medicine? Before answering this question, however, a look at its compass and content are in order. The first chapter reviews critically selected discussions of social medicine by some earlier writers on the subject. Here the first limitation is revealed. Despite the comprehensive implications of the title, this study is concerned almost exclusively with the definition, discussion, practice, and teaching of social medicine in Great Britain. Only two contemporary writers on the subject from other countries, one a Belgian, the other an American, are considered cursorily. No others are mentioned. For practical purposes, then, ideas of social medicine and practice derived therefrom in Germany, Austria, France, Italy, Scandinavia, and other parts of the world are not considered. Indeed, this chapter might more accurately have been entitled "Views of Social Medicine in Britain as seen by an American Physician."

This severe limitation in scope is very intimately linked to the author's concept of social medicine and the historical derivation which he imputes to it. While Galdston nowhere explicitly defines social medicine, what he means by the term is clear enough. Stated succinctly and perhaps in oversimplified form, he regards social medicine as founded on an ecological theory of man and eventuating in practice in a focus on life, health, and the full development of human potentialities rather than upon disease, disability and death. Based upon this view, he believes that social medicine arose in England "in the minds of several British pioneers." In the second, third, and fourth chapters, this thesis is developed, together with an explanation of the failure of modern medicine to evolve those aspects of health care with which social medicine is concerned. Galdston correctly points out that etiological medicine has been concerned with the specific and the specialized activity,

and in this way has achieved remarkable successes, especially in combatting and controlling communicable disease, but in so doing has lost sight of the whole man and the promotion of his health. A chapter (V) is then devoted to a consideration of the effects of the development and "failure" of modern medicine in terms of morbidity and mortality. According to Galdston "The data which witness modern medicine's triumphs, the statistics that reflect the declining death rates and the increase in life expectancy (at birth), when critically examined add up to the summation that modern medicine has in a large measure converted mortality into morbidity. Those whose lives it has helped to save in many instances face not an extension of existence in well-being and in health, but merely a prolongation of endurance. Those who by the skills of modern medical science have been saved from death all too often have been saved only to longer endure the burdens of a variety of illnesses, and to die at a later age." The fact is that people live longer today. Whether this is a fate worse than death many of them might deny. Galdston believes, however, that "it is the grim awareness of these side effects and coincidents of modern medicine that has stirred some of the more earnest and far-sighted students to review critically the prevailing philosophy, the current teaching and practice of medicine, and to come forth with an agendum for their reform which, with sufficient but not easily grasped warrant, is designated as social medicine." Finally, "the quintessence of the argument" is presented in the concluding chapter which deals with social medicine and medical education. Here Galdston offers a preview of medical education were it to be based on the philosophy of social medicine. It would be dynamic rather than descriptive, and would include such areas of knowledge as biology and its history, the history of medicine with specific attention to the fundamental ideas of different periods, elements of anthropology, individual and group psychology, philosophy, and sociology of communal life. With this one can emphatically agree. An additional section entitled "Social Medicine in England" completes the book.

Now the question may again be raised: How and what does this study contribute to an understanding of social medicine? Within the terms indicated by the author, that is, in terms of the historical analysis upon which the conclusions are based, the answer can only be that it contributes little to a better understanding of social medicine.

The historical analysis is fatally flawed by several premises that cannot be substantiated. The first of these relates to the genesis of social medicine. According to Galdston, it simply occurred (page 5). It did not emerge in response to any needs or on the basis of any existing societal conditions. Its history is the history of medicine, the concept having appeared primarily because of the progress of medicine itself. A moment's reflection, however, will show that this position is untenable. For a historian to say that some historical event has simply occurred means nothing as far as understanding it is concerned. It is essentially an abnegation of the task of the historian. In fact, Galdston does not himself completely accept this position, for on page 102 he says that "Social necessity was and is the mainspring of the movement for social medicine."

This contradictory position on the question of the origin of social medicine is closely linked to a second thesis, namely, that a sharp cleavage separates German

and British usage of the terms "social" (*sozial*) and "social medicine" (*soziale Medizin*). (Except for a discussion of Jules Guérin in 1848, French and Italian usage is not considered.) According to Galdston, the primary connotation of the German word *sozial* is "communal" or "governmental," while *soziale Medizin* is governmental medicine. Furthermore, he links these to another concept, *Arznei Polizei* (sic) under which the German movement for medical care insurance is alleged to have occurred.

On several grounds one is compelled to reject this thesis as untenable. Let us consider the use of the word "social." It appears prominently in France in the eighteenth century, where in the *Encyclopédie* it simply meant honest or sociable. In Rousseau's *Contrat social* the word assumes its modern sense, referring primarily to the relations that exist between men in society, and secondarily by extension to the products of these relations. During the eighteenth century and then in the nineteenth and twentieth centuries the term "social" is applied in these senses by those who studied or wished to solve problems of health and disease, whether in England, France, Germany, or the United States. And the English were just as ready to use governmental action as any other people when it was felt necessary. It is significant that the very English public health movement that is so carefully separated from the Germans made extensive use of government action to achieve its ends. Beginning with the New Poor Law of 1834, legislative measures dealt with all sorts of health problems. Indeed as early as 1859 Edwin Chadwick was advocating that governmental authorities go into business on a monopolistic rather than a competitive basis; and a decade later, in 1870, the Poor Law Board seriously considered the establishment of a system of free medical care to all wage-earners in England and Wales. (See George Rosen: Economic and Social Policy in the Development of Public Health, *Journ. Hist. Med.* 8:406-430, 1953, especially pp. 428-429).

Furthermore, the use of the term *soziale Medizin* in German-speaking countries did not necessarily imply government action. Indeed, German usage and thinking in this area were originally considerably influenced in the nineteenth century by French and later by English developments. (One of the weaknesses of Galdston's book is that it omits any consideration of reciprocal international influences). It is true that a few German authors at the end of the nineteenth century and during the early twentieth century used the term social medicine for medical care insurance, but this was not generally true. As an example of the use of this term in an ecological sense, one may cite Gottstein. (Adolph Gottstein: "Einführung in das Studium der socialen Medizin," in Leyden and Klemperer: *Die Deutsche Klinik* XIV, Bd. III. Ergänzungsband, Berlin and Wien, Urban and Schwarzenberg, 1913, p. 418). Not only were the German authors aware of this distinction, but Alfred Grotjahn, the outstanding German exponent of social medicine, introduced the term "social hygiene" so as to avoid any misunderstanding.

Finally, one must point out that there was no term or concept of *Arznei Polizei* employed in relation to the German sanitary movement or the movement for medical care insurance. Presumably, the author meant *medizinische Polizei* or *Medizinalpolizei*, the larger concept of which *Arznei Polizei* is a part. Actually, the latter refers only to governmental supervision and inspection of apothecaries

and medicaments. The former term is the concept referable to those theories, policies, and practices arising from the political and social basis of the absolute, mercantilist German state during the seventeenth and eighteenth centuries for action in the sphere of health and welfare. The development and exploration of the concept of medical police was a pioneer endeavor in the systematic analysis of the health problems of community life. Noteworthy, moreover, is the circumstance that the concept was not limited to Germany. Andrew Duncan, John Roberton, Robert Cowan, and others employed the term in Scotland and England during the early nineteenth century and even later. This is true also of the United States, France, Belgium, Italy, and Russia.

This brings us to the heart of the matter. The basic flaw in Galdston's historical analysis and exposition is that he does not actually trace the evolution of social medicine so as to grasp its meaning. The focus of his work is much too limited to permit such an analysis. To grasp the meaning of social medicine let us look at the problem in this fashion.

No organism can be intelligently understood unless its environment is also understood. All organisms live in and by means of an organized habitat with which they enter into a dynamic interaction. The organism modifies its environment and the environment in turn affects the organism. In general, the more complex and reactive the organism, the greater the magnitude of these mutual effects. These statements apply to human beings as well as to other organisms. Social medicine is concerned primarily with the effects of organism-environment interaction produced through the social relationships, social organization, group memberships, institutions, and so on of the world in which we live and move. Social medicine is concerned with what is true of man's health by virtue of the fact that he lives a group life.

Throughout known history, men living in communities have had to take account in one way or another of health problems that derive from the biological needs and attributes of their fellowmen. Out of such need for action there has developed with increasing clarity a recognition of the signal importance of the social environment in the promotion of health and the prevention and treatment of disease. The term social medicine epitomizes this recognition. Such a concept did not emerge full-blown, but developed over a long period of time, and even today has not been fully explored. From this point of view, the concept of social medicine must be seen as the product of an ongoing historical process operating in various political, economic, and social systems. Furthermore, one may expect to find a variety of conceptualizations embodying greater or lesser recognition of the significance of the social environment in relation to health promotion and disease prevention. In fact, even where there is no concept of social medicine there is already concern in some degree with those problems of health.

Intimations of such recognition may already be found in the Hippocratic writings, but they are not separated from the larger ecological macrocosm-microcosm concept. Within medicine itself this orientation tends to support impulsions from other aspects of the society. Early conceptualizations begin to appear, however, in the sixteenth, seventeenth, and eighteenth centuries reaching their most advanced forms at this time in the ideas of "political arithmetic" and "medical police"

in England and Germany respectively. (See George Rosen: Medical Care and Social Policy in Seventeenth Century England, *Bull. N. Y. Acad. Med.*, 2nd ser., 29: 420-437, 1953; also: Cameralism and the Concept of Medical Police, *Bull Hist. Med.* 27: 21-42, 1953; also: Political Order and Human Health in Jeffersonian Thought, *Bull. Hist. Med.* 26: 32-44, 1952). Under the influence of political and economic factors, a new appreciation and comprehension of the social environment in relation to health developed, culminating in the creation of a concept of social medicine around 1848 in France and Germany. As Galdston correctly emphasizes, a concept cannot be put into practice if the technical means for so doing are not available. For this reason these concepts could be applied only to a limited degree, but each in turn provided impulsions which facilitated later developments. Thus, it is oversimplification to say as Galdston does that modern social medicine does not derive from the hopes and inspiration of the "forty-eighters" or of their immediate forerunners. This is tantamount to putting up and knocking down a strawman. What is true, however, is that one can trace these concepts in manifold ramifications in different countries through the nineteenth century, leading eventually to the development of new concepts in our own time.

Thus, any endeavor to understand modern social medicine must take into account not only Great Britain, but as well France, Germany, and other countries where conceptualizations of the relation between health and social environment have been developed. For example, no one seriously concerned with this subject can omit consideration of the concepts of social medicine developed in Germany, in particular the ideas of Grotjahn, which had a wide influence on the development of this field in other countries, notably in Central and Eastern Europe (see George Rosen: What is Social Medicine? *Bull. Hist. Med.* 21: 674-733, 1947, especially pp. 709-715). Furthermore, it must be recognized that developments in particular countries exhibit specific characteristics due to conditions peculiar to the country. (For example, see George Rosen: The Idea of Social Medicine in America, *Canadian Med. Ass'n., Journal* 61: 316-323, 1949).

The book reviewed here is lacking in these respects. Its strongest point lies in its discussion of social medicine and education. From this point of view it will be of interest to anyone concerned with medical education and possible reform in this area. It does not, however, fulfill the promise of its title. There is still room for an objective analysis of the meaning of social medicine.

GEORGE ROSEN

BRUNO KISCH. *Forgotten Leaders in Modern Medicine: Valentin, Remak, Auerbach.* Transactions of the American Philosophical Society, N. S., vol. 44. pt. 2, 1954, pp. 139-317. Philadelphia: The American Philosophical Society, 1954. Ill. $2.00.

Here at last we have the first and adequate biography of one of the greatest pioneers in biology and histology, Robert Remak. It forms the centre of a series of biographies of some of Remak's contemporaries. Each of these is distinguished by

everlasting merit in a field closely related to Remak's. Moreover, their faithful adherence to Judaism greatly hampering their career and research at a time of twilight between so-called Jewish emancipation and reaction in Germany renders their life histories strangely similar to each other. Remak, however, is the greatest and most remarkable genius of them all. His life rightly occupies 70 out of the total of the 178 pages (i. e. nearly half) of the book. In Remak's life the multitude of fundamental findings contrasts with the absence of any early recognition and a series of nightmarish vicissitudes in his career and health. In 1835, at the age of 20, he discovered the axis cylinder and the connection of nerve fibres with nerve cells. He established this discovery in 1837. Remak's teacher, Johannes Müller, though doubting the young student's discovery and agreeing with Valentin's opinion that the nerve fibres only surround the ganglion cells with their terminal parts. published Remak's paper in his own *Archiv*, and mentioned Remak's observation of a ganglion of the accessory nerve. To this, Remak added the first description of the primitive non-medullated sympathetic nerve fibres (later called Remak's fibres) —again vehemently opposed by Valentin and also by the latter's friend, Jacob Henle, another pioneer, of Jewish extraction, in the same field. The great Purkinje, however, convinced himself of the correctness of Remak's findings, to which he contributed the term " axis cylinder," formerly believed by him to be a hollow channel. Not until 1842 did Valentin, the famous professorial authority of Zürich, " reluctantly admit his mistake . . . and so did Henle in 1849. Remak was the victor, but only after a hard, nerve-racking struggle, at a time when he was suffering from a serious chest disease and fearful of imminent death." (Kisch, p. 235.)

Remak's thesis of the continuity of nerve fibres and ganglion cells was finally confirmed, though still not attributed to its real author, in Helmholtz's doctoral thesis of 1842. Remak's doctoral thesis of 42 pages, *Observationes anatomicae et microscopicae de systematis nervosi structura*, Berlin, 1838, thus remains one of the fundamental works of 19th century medicine. Yet such authorities as Kölliker and Rud. Wagner claimed Remak's discoveries for themselves in 1845 and 1846 respectively. Henle had witnessed Remak's discoveries in Müller's laboratory in 1837 and reported them extensively in his *Pathologische Untersuchungen* of 1840. In 1871 he gave the credit for the description of the nerve-ganglion cell continuity to Wagner and added that Remak had published similar findings in 1854. As late as 1899 hostility to Remak is still recognisable in Stieda's article on the development of our knowledge of nerve cells and nerve fibres. Similarly, Remak was pushed out of his discovery of the " Omnis Cellula a Cellula " principle through its subsequent elaboration, propagation, and arrogation by Virchow. The latter defeated Remak twice as a competitor—first for the post of morbid anatomist to the Charité Hospital in 1845 and again, in 1856, for the Berlin professorship in pathology. Unfortunately, in the competition for the latter appointment, we find Virchow implicated in an academic intrigue. Virchow, " the barricade fighter for freedom and justice for all in 1848 " and the author of an article against favouritism and nepotism in the academic world (*Mediz. Reform* 1848), " had a very different mind concerning justice as soon as the matter touched his own ambition " (Kisch, p. 280). What is worse, Virchow aimed an ugly scheme at the venerable Alexander von Humboldt, who had recognised Remak's genius at an early time and remained his staunch supporter to the last. " Virchow chose to interpret the attitude of this

outstanding man as the not readily comprehensible philosemitism of an old fogey" (Kisch, p. 281), and suggested to his father-in-law that the services of an eminent Jew be enlisted to plead his cause with von Humboldt. This, however, need not necessarily be interpreted as a sign of anti-semitic sentiment, but rather as a shrewd business move. Such an incident goes far in stripping Virchow of much of his glory, but it is well known that Virchow was petty and importunate in procuring jobs for himself and members of his family. His importunity, indeed, formed the subject of a minute in the proceedings of the Prussian Diet. What is perhaps more deplorable on his part is his minimising and, at times when it seemed more advantageous to his own career, actually omitting to recognize Remak's authorship of the "Omnis Cellula a Cellula" principle—the principle so widely publicised by Virchow and forming the foundation stone of his immortality.

There were, however, extenuating circumstances, which Kisch might have adduced. Canvassing was the usual practice in securing academic appointments in Germany, as the famous example of Johannes Müller shows. In more recent times, the Fama Academica had it that a competitor submitted the writings of his "superior" rival to the faculty, heavily underlining his rival's original and unconventional views. The opposition aroused in the faculty by these unorthodox pronouncements resulted in the appointment of the denouncer. Furthermore, Virchow, inferior to Remak as a histologist and general biologist, but highly appreciated by his momentous researches in pathology (notably on embolism and leukemia) and superior to Remak as a "showman," editor, and critic, was probably the more popular candidate for the post of Professor of Pathology. However, these instances and many similar ones in Remak's life are well documented, illustrated, and reported by Kisch and are of the utmost historical interest and significance.

Remak's further studies were notably on the function of the ganglia and organic nerve fibres in influencing involuntary movement and secretion throughout the body, researches that led to the establishment of the "autonomic nervous system." Others include his fundamental research on the germinal layers of the embryo, masterly observations in connection with the so-called Horner syndrome (14 years before Horner), the discovery of the Achorion Schönleinii, and finally the creation of modern galvanotherapy. Over-enthusiasm for the latter involved him in some unpleasant struggles with the medical profession. "Meeting the resistance of his confreres, he carried his enthusiasm to the public, in publications in non-medical journals, and this increased the furor in the profession. Here was a doctor who, for decades, had been refused a suitable position or working facilities in the field where he undoubtedly excelled, who was not given even the title of assistant professor, and who was now a practitioner doing very well with a newly invented method attracting patients, and curing them, even though physicians of long standing were unable to do so. Now every one of the practitioners denounced Remak, asking why he did not remain in the field of his original research, but nobody came forward with an answer to the question, in which laboratory he should have continued to do research." (Kisch, p. 287.)

Tempting as it is, there is no room to say anything more about further detail, let alone to go properly into the other biographies collected in this volume. The latter forms a major contribution to 19th century medical history. The author has not left any stone unturned in procuring documentary detail which illuminates the

whole background of his story, notably the history of Jewish emancipation and the growing out of it of a series of heroic non-conformists to whom histology and biology owe their foundation. Drawing on his own collections, the author has been able to illustrate his work with a most beautiful, pertinent, and topical series of pictures, prints, and documents. It is to be hoped that his book will re-appear in a less unwieldy format.

WALTER PAGEL

ETHEL JOHNS and BLANCHE PFEFFERKORN. *The Johns Hopkins Hospital School of Nursing*, 1889-1949. Baltimore: The Johns Hopkins Press, 1954. xvi + 416 pp. Ill. $4.50.

This book was sponsored by the Alumnae Association of the Johns Hopkins Hospital School of Nursing. It is an account of the founding and sixty-year history of the school. For many years the Alumnae Association and the School of Nursing have been collecting source material which has provided the authors with a solid foundation for the writing of the school's history.

As authors the Alumnae Association selected two well-known nurse educators and authors, Ethel Johns and Blanche Pfefferkorn. Miss Pfefferkorn is a graduate of the Johns Hopkins Hospital School of Nursing. Instead of integrating their research into a single history, the authors have chosen to work separately and to divide the study into two periods: the first from 1867 to 1907; the second from 1907 to 1949.

Miss Johns, the author of the first part of the history, finds the key to the development of the school in the personalities of two uncommon women, Isabel A. Hampton and M. Adelaide Nutting, the first two principals of the school. When the school was officially opened on October 9, 1889, it was the first training school for nurses in the Baltimore area. This period was one of continuous growth under the direction of these two leaders who "had high ideals of nursing, far-seeing vision, and a dream for the future." By the time Miss Nutting left Johns Hopkins, in 1907, certain advances had been made which placed the school in a commanding position—the extension of the course from two to three years, the abolition of cash allowances to students, the establishment of a six-month preparatory course, the reduction of the ward schedule from nine to eight hours, and the requirement of graduation from high school or the education equivalent for admission to the school.

The next period from 1910 to 1940 under the direction of Elsie M. Lawler followed a different pattern. The development of the school was influenced by the great expansion of the hospital from 1910 to 1920, the demands of World War I, and the influenza epidemic. Miss Pfefferkorn concludes, "While the new departments in the Hospital brought new opportunities for training, the greater numbers of patients militated against a satisfactory education experience. . . . The School might preserve its present program, but it could not intimate new educational plans."

In the history of nursing education the period following World War I was a time of close examination of the programs offered throughout the country. The Johns Hopkins School also initiated a series of studies which resulted in a recom-

mendation, in 1928, that the School of Nursing be affiliated with the Johns Hopkins University. A relationship was established in 1935 and amplified in 1947. By 1949, however, the School of Nursing had not been reorganized into a collegiate school; it remained a hospital school.

Anna D. Wolf succeeded Miss Lawler in 1940. The School again faced the demands of a world war. In spite of the pressure to admit large numbers of students to fill the gap left by graduate nurses who entered miiltary service, several significant developments may be seen. During this period military discipline was replaced by a counseling program; the administrative and teaching staffs were organized as a faculty; the Student Association of the Johns Hopkins School of Nursing was formed; and in 1949 the 44-hour week, including both class and practice, became an accomplished fact for all students.

The Alumnae Association can be proud of the Johns Hopkins School of Nursing and this history written under its sponsorship. The method selected by the authors has resulted in what is essentially the production of two histories. Because of the abrupt division in time sequence and complete change in style, the history lacks continuity. It should not have been neecssary to add such special studies as the library, life in the school and the alumnae association. All these topices are significant elements in the development of the school and would have been more meaningful if properly integrated with the narrative.

MARY JANE RODABAUGH

RICHARD M. BURKE, *An Historical Chronology of Tuberculosis.* Second Edition. Springfield, Illinois: Charles C. Thomas, 1955. xiii + 125 pp. Ill. $3.75.

This small volume will be highly useful for all investigators or historians concerned with progress in the control of tuberculosis. It has been significantly expanded in scope since the appearance of the first edition in 1938, but by good press work, with a change in printing stock, the publisher Charles C. Thomas has maintained its original size and convenient format without page crowding. The book lists in chronological order, with inclusive dates and brief documentation, the principal events in the history of tuberculosis from ancient times to 1953. The list of recent events includes epoch marking discoveries in the chemotherapy of tuberculosis and milestones in mass radiography and other measures in prevention. Noteworthy additions to the first edition are six significant illustrations and an exceedingly serviceable bibliography. One misses a graphic outline of the development of knowledge of tuberculosis, carried in the first edition, which correlated progress in tuberculosis chronologically with significant social and other developments in tuberculosis. This might be restored with profit in a future edition.

ESMOND R. LONG

THE BULLETIN RECENTLY RECEIVED *

Erwin H. Ackerknecht. *A Short History of Medicine.* New York: The Ronald Press Company, 1955. xviii + 259 pp. Ill. $4.50.

Cesar Rodriguez Exposito. *Medicos en la Vida de Marti.* Havana: Ministerio de Salubridad y Asisteneia Soeial, 1955. 75 pp. Ill.

Norman H. Franke. *Pharmaceutical Conditions and Drug Supply in the Confederacy.* Madison, Wiseonsin: Ameriean Institute of the History of Pharmaey, 1955. 47 pp. Ill.

Félix Hurtado Galtés, and others. *La Obra y la Gloria de Finlay Reconocidas por el XIV Congreso Internacional de Historia de la Medicina.* Havana: Ministerio de Salubridad y Asistencia Soeial, 1955. 99 pp. Ill.

Robert Montraville Green. *Asclepiades: His Life and Writings.* A Translation of Coechi's *Life of Asclepiades* and Gumpert's *Fragments of Asclepiades.* New Haven, Conn.: Elizabeth Lieht, 1955. ix + 167 pp. $6.00.

Mirko Drazen Grmek. *Bibliographia Medica Croatica.* Descriptio librorum artieulorumque de humana, veterinaria medieina pharmaceutieeque spectantium ad Croatiam. Pars I: Libri. Faseieulus I: 1470-1875. Zagreb: Izdavkog Jugoslavenske academije, 1955. 230 pp. Ill. (In Latin and Croatian.)

Mirko Drazen Grmek and Stanko Dujmusie (editors). *Iz Hrvatske Medicinske Proslosti* (From the Medical Past of Croatia). Zagreb: Medieal Assoeiation of Croatia, 1954. 314 pp. Ill.

George Sarton. The Appreciation of Aneient and Medieval Seienee during the Renaissanee (1450-1600). Philadelphia: University of Pennsylvania Press, 1955. xvii + 233 pp. $5.00.

J. H. Van Den Berg. *The Phenomenological Approach to Psychiatry.* An Introduetion to Reeent Phenomenologieal Psyehopathology. Springfield, Ill.: Charles C. Thomas, 1955. ix + 105 pp. $3.00.

Kenneth Walker. *The Story of Medicine.* New York: Oxford University Press, 1955. 343 pp. Ill. $6.00.

* The *Bulletin* reserves freedom of decision as to the publications to be listed in this section.

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